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FRANK P. FOSTER, M.D.,

PHYSICIAN FOR DISEASES OF WOMEN TO THE OUT-PATIENT DEPARTMENT OF THE NEW YORK HOSPITAL.

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THE CORPUSCULAR ELEMENTS OF THE BLOOD; THEIR ANATOMY AND PHYSIOLOGY, NORMAL AND PATHOLOGICAL.*

By ALEXANDER DUANE, M. D.

The blood, as the great nutrient fluid of the body, has always engaged the study of physiologists. Of late years this study has been directed more and more to the corpuscular elements which it contains—elements which are interesting to the physiologist on account of their relative abundance, their important function, and the mystery attaching to their origin; but still more to the pathologist, because of the universal part they seem to play in every variety of morbid process occurring in the body. A vast deal of laborious and painstaking investigation has, indeed, been expended upon this subject, and we are, accordingly, already in possession of a great number of well-ascertained facts bearing upon the structure and relations of the blood corpuscles. Moreover, this stock of facts is constantly receiving additions. But, as is commonly the case, with each new discovery new problems demanding solution have arisen, and new theories have replaced the old. So we are once more forced to apply our tests of experiment and observation, which again open up fresh fields of discovery and of doubt. So rapidly does this remodeling process go on that, every few years, we are obliged to leave our old position and view the facts from a new standpoint. It is with the view of collecting in a readily accessible form the latest achievements in this department of physiology, of showing, as nearly as may be, where we are standing to-day, that this essay has been written. It aims to be a compilation merely, from the best and most recent authorities, of what is at present known in regard to the physiology and pathology of the formed elements of the blood.

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* A thesis submitted for graduation at the College of Physicians and Surgeons, New York.

VARIETIES OF CORPUSCULAR ELEMENTS.—Ordinarily only two kinds of blood corpuscles are described, the red and the white. Besides these there are found certain small granules, called "elementary corpuscles," or microcytes. Less certainly known to exist, although still claiming a place in this enumeration, are the "hæmatoblasts" of Hayem and the uncolored disks of Norris. Moreover, the red and white corpuscles themselves have been subdivided by different observers into several specific varieties.

The white corpuscles are also known as leucocytes (i. e., "white cells"), a name which they share with several other cellular organisms. We have no such convenient designation for the red corpuscles. They were originally called globules, from an erroneous conception of their shape; in some of the French works they are spoken of as *hématies.* The latter term is rather inappropriate, as it should comprehend all varieties of cells found in the blood. Besides, it does not readily form derivatives comparable to leucocytosis and leucocythæmia. On this account we have ventured to suggest the name *erythrocyte* (i. e., red cell); and, in the following pages, we shall use this term as synonymous with red blood corpuscle.

MODES OF STUDYING.—The corpuscles, when removed from the vessels, may be examined in natural serum, in an artificial serum, in alcohol or glycerine, or may be spread in a thin layer upon a slide and dried. The natural serum may be blood-serum, lymph, amniotic fluid, or urine.* These fluids are usually treated with a little iodine and then filtered. Artificial serum may be made of a solution of egg-albumen, or of dilute solutions of the neutral salts, especially of sodium chloride, sodium sulphate, and bichromate of potassium. The latter salt seems to act pretty well as a preservative; the former is used in fresh preparations. The sodium-sulphate[*] solution is recommended by Malassez for use with the cytometer. The dry method, which consists in rapidly spreading a drop of blood in a thin, even layer, often preserves the corpuscles for a long time, especially if they are fixed by exposure to the vapor of osmic acid.

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* Recommended by Kostjurin, of St. Petersburg, and used by us with success.

After preparation by any of these methods, the corpuscles may be treated with various chemical reagents or with coloring matters, or may be subjected to the action of heat, cold, or electricity.

Without removal from the vessels, the blood cells may be examined in microscopic sections of any vascular tissue. They can, finally, be seen circulating in the vessels of the living animal. They are thus commonly observed in the web of a frog's foot, in the mesentery or the tongue of the same animal; indeed, in any part which is thin enough to allow the transmission of light. Hüter[†] and others have applied the same method of examination to the human lip, where they have been able to make out the corpuscles passing through the vessels, and have found it possible to distinguish the red from the white. This procedure has received the rather high-sounding title of "cheiloangioscopy."

APPEARANCE UNDER THE MICROSCOPE.—When a drop of blood, treated in any of the ways above described, is brought under the field of the microscope, we see numberless circular[‡] bodies, each presenting a central dark spot and a surrounding bright rim. These are the red corpuscles, or erythrocytes. As they turn over and over in the stream, they are seen to be discoid in shape, and the central dark spot resolves itself into a bilateral concavity. Every one who owns a microscope has, doubtless, verified this fact for himself; and yet it is only within a comparatively short time that it has been universally accepted. As late as 1850, Hewson's idea that the corpuscles were spherical sacs, containing a central globule of uncolored substance, was maintained by Craigie;[#] and it must be noted that this opinion, although certainly false in the majority of cases, is not indefensible, for so recent an investigator as Arndt conjectures that, in some cases at least, the appearance of a central spot is due to a residual granule, a relic of those which, according to his hypothesis, once constituted the whole corpuscle. The erythrocytes, although distinctly and even brilliantly red when grouped in masses, appear of a pale reddish-yellow when examined singly; and the higher the magnifying power employed, the less marked does this coloration become.

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[*] "Hayem's Fluid," for showing hæmatoblasts and preserving the corpuscles, is prepared as follows: ℞ Hydrarg. chlorid. corrosiv., gr. ijss; sod. sulphat., gr. xxiv; sod. chlorid., gr. v; aq. destillat., f℥ ij. M.

[†] "Centralbl. f. d. med. Wissensch.," 1879, 13.

[‡] "The only perfectly circular elements in the body."—Dalton.

[#] This view, although severely criticised ("Brit. and For. Med.-Chir. Rev.," 1848), afterward appeared unchanged in the "Encyclopædia Britannica" (Article, "Blood").

Here and there among the red corpuscles may be seen a few white globules, or leucocytes. These are usually larger than the former, are spherical in shape, and are of a pale gray color. They are often granular, and, even without additional treatment, may present one or more nuclei.

These are the ordinary forms under which the blood cells appear. But a careful examination often detects minor varieties. Thus, among the erythrocytes are found some of about two thirds the normal size, and no longer spherical but discoid in shape (Cornil and Ranvier); also some in which an encircling rim is wanting and which may be granular (Arndt). The microcytes, or elementary corpuscles, are small, spherical, highly refractive, red granules, which appear to have the same composition as the erythrocytes, and are, indeed, regarded as fragmentary remains of the latter. Though occurring in small numbers, they may be said to be a regular constituent of normal blood; in certain diseased states they are enormously increased.

The leucocytes have been variously subdivided. Thus, Arndt* makes three sets: (*a*), the ordinary large, granular cells; (*b*), cells of the size of a red corpuscle and tinted yellow or yellowish-red; (*c*), cells of half the size of a red corpuscle and non-granular. Hayem's † classification is nearly the same, except that he adds a fourth set, like (*c*), but granular and containing pigment (hæmoglobin). Ehrlich ‡ has a still more elaborate division into five classes, arranged according to their reaction with coloring matters; of these it is necessary to mention only the "eosiniphile" leucocytes, or leucocytes of Semmer, which are remarkable for their great size and the resemblance of their coloring matter to hæmoglobin.

The "hæmatoblasts," # according to the description of their discoverer, Hayem, ‖ are homogeneous, non-nucleated, discoid bodies, showing a very faint coloration inclining to yellow or green, or, in some cases, are entirely destitute of color. They vary very much in size, although always smaller than the erythrocytes. They show a tendency to collect in groups, and to surround themselves with a viscid exudation. Their great characteristic is their destructibility, which is so marked as to require special means for their preservation. For this reason also they are readily distorted by the action of disturbing agents, unless they have been previously fixed by the use of certain methods which their discoverer has indicated. Hayem demonstrates their existence by using a stage which is kept at the temperature of about 1° C. [33·8° F.], by employing a thin glass cover fastened to the slide with paraffin, beneath which the blood is drawn by capillary attraction, and also by adding to the blood from twenty to a hundred parts of his solution of corrosive sublimate (see above).

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* "Berl. klin. Woch.," 1876, No. 29.

† "Arch. de Physiol.," t. vi, 1879.

‡ "Ztschr. f. klin. Med.," Bd. I, 1880, p. 553.

# This name is also given to certain cells in the marrow of bone, and to cells in the embryo which subsequently develop into blood corpuscles.

‖ "Arch. de Physiol.," t. v (1878), p. 692, and t. vi (1879), pp. 201, 597.

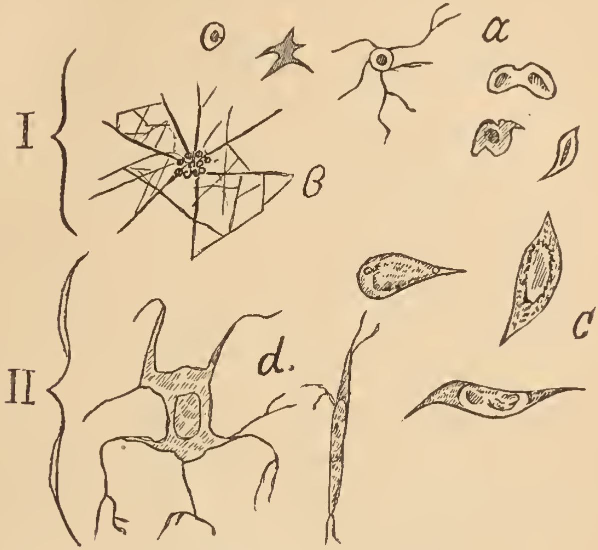

Fig. 1.—Hæmatoblasts. (After Hayem.)

I. In man. II. In the frog. *a*, distortion observed in hæmatoblasts when outside of body; B, *d*, hæmatoblasts in network of coagulated fibrine; C, hæmatoblasts circulating in vessel of a frog.

It seems to us a suspicious circumstance that it is just by these means that the disintegration and decolorization of the red corpuscles are effected. This is seen in Figs. 2 and 5, which are taken from our own observations. The fragments so formed do simulate pretty closely the bodies which Hayem describes. This author claims, however, to have seen hæmatoblasts circulating in the vessels of the frog. This observation, as far as we know, has not yet been confirmed by any other microscopist.

Norris * described certain colorless, biconcave, discoid forms, whose existence in the blood he imagined that he had demonstrated. It has been objected to his discovery (and, we think, very justly) that his methods of preparation were such as to decolorize the red cells, and so produce artificially the appearance which misled him.

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* "Lond. Med. Record," Jan., 1880.

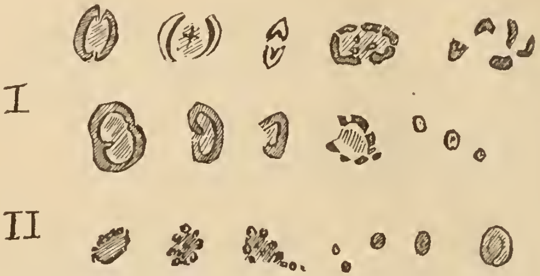

FIG. 2.—DISINTEGRATION OF RED CORPUSCLES.
I. By action of Hayem's fluid, or by cold. II. By suction under a thin cover tightly pressed on slide.

Nucleated red corpuscles and various "transition forms" are reported to have been seen in the blood, but more often in a diseased than in a healthy condition of the system. They are certainly, if present at all, abnormal constituents, and as such may be dismissed from this consideration, which takes in only the elements of normal blood.

FREQUENCY, ABSOLUTE AND RELATIVE.—The vast number of the red corpuscles and their great preponderance over the white strike the observer at the very first glance through the microscope. The entire mass of the former may be roughly stated as making up about one third of the total weight of the blood; this estimate, given by the more recent investigators, is somewhat lower than the one ordinarily set down. Such a statement, of course, gives us no clew as to the number of blood cells contained in a determinate space. The solution of this problem, requiring, as it does, the use of instruments of precision, has been obtained only within the last thirty years. As the matter is becoming an object of clinical interest, and the hæmatocytometer seems about to take its place alongside the sphygmograph and the thermometer, it may not be amiss to glance briefly at the different methods in use for numerating the corpuscles of the blood.

The first attempt in this direction was made by Vierordt.* In his method, which required a week of untiring labor for a single numeration, a capillary tube containing undiluted blood was carefully calibrated, and the volume of its contents determined; the blood was then spread out in thin streaks upon a slide, and the number of corpuscles in each streak was counted. This plan was subsequently improved by diluting the blood and by counting the corpuscles while still contained in the tube. Gowers's instrument, which has been extensively used for clinical purposes, on account of its convenience, consists essentially of a glass stage-plate carrying a cell $\frac{1}{5}$ mm. deep, and divided into squares, $\frac{1}{10}$ mm. on a side. Into this cell a drop of blood diluted up to $\frac{1}{200}$ is placed, a cover-glass is put over it, and the corpuscles are allowed to subside. Evidently the number present within each square, multiplied by 100,000, will give the number of corpuscles to the cubic millimetre. Since two squares usually contain 100 erythrocytes, Gowers has proposed for this space the term "hæmic unit." It corresponds to $\frac{1}{50000}$ of a cubic millimetre.

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* "Schmidt's Jahrbücher," 4, 1852.

This instrument is quite convenient, and is accurate enough for most clinical purposes. It is, however, liable to several sources of error. One is careless dilution, so that more or less than $\frac{1}{200}$ part of blood enters the cell. Another is inaccuracy in the depth of the cell itself. The latter defect is remedied in Malassez's modification* of the instrument, in which the depth of the cell can be adjusted so as to be always just $\frac{1}{5}$ mm.

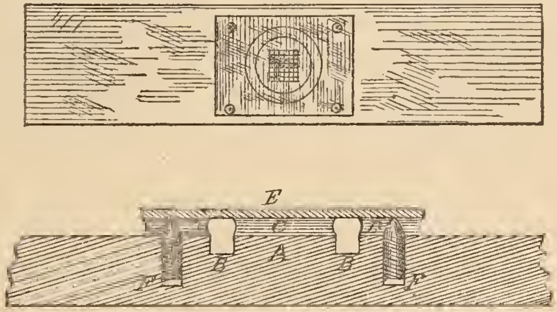

Fig. 3.—Malassez's Hæmatocytometer.

A, circular portion of glass slide separated from remainder by (B B) a gutter cut into the glass ; C, diluted blood under examination ; D, film of fluid (oil or glycerine) protecting C from evaporation ; E, cover-glass resting upon (F F) adjustable screws.

In all these methods the number of corpuscles is determined directly ; but there are also ways of determining this indirectly, by examining the tint or the degree of opacity of the blood. These colorimetric methods will be referred to again, when speaking of hæmoglobin. It is sufficient to say here that, while furnishing valuable information as to the state of the blood, they can not serve as an exact measure of the number of red corpuscles present.

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* "Arch. de Physiol.," t. vii, 1880, p. 327.

However determined, the number of erythrocytes is found to vary within very considerable limits, even in health, ranging from 3,500,000 to 6,000,000 or 7,000,000 in a cubic millimetre. The average number is given by some authors (Flint) as 4,000,000. Welcker's estimate, however, which is more generally adopted, places it at 5,000,000; and more recent investigators seem disposed to assign a still higher number, 6,000,000 being the figure chosen by Baxter and Willocks.* The leucocytes, on the other hand, are considered by recent observers to be less numerous than was formerly believed. In the adult they amount only to 5,000 or 6,000 in a cubic millimetre (Hayem),† 6,800 (Dupérié),‡ 10,000 (Hunt).# In the light afforded by these figures, it seems curious that before the days of experimental research the red corpuscles were thought to be only eight or ten times as numerous as the white. When, however, Moleschott brought the matter to the test of actual numeration, he found that a much greater disparity existed. The examination of forty-eight individuals gave him an average ratio of three hundred and fifty-seven red to one white; although in some the ratio was only one hundred and seventeen to one, in others it amounted to seven hundred and nine to one. The later results, quoted above, would place the average ratio somewhere between five hundred and one thousand to one. Such a valuation must, of course, be approximative only; it varies not only with the individual, but also with the age, sex, and general condition; with the ingestion of food and the action of various disturbing agencies; and, moreover, it varies in different parts of the body.

Age seems to exert very little effect on the number of the erythrocytes, except that they are diminished in advanced life. The white cells, on the other hand, are present in much greater abundance in the infant than in the adult. During the first forty-eight hours of life Hayem has found their number to amount to 18,000 in a cubic millimetre. From this point it rapidly diminishes until, in early childhood, it reaches the normal figure for adults. They also, like the red cells, are said to become fewer in old age. In women both varieties of corpuscles are less abundant than in men, except during menstruation and pregnancy. In both these conditions the leucocytes are increased, the additional quantity in the former state amounting, according to Hayem, to one or two thousand in each

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* "Lancet," 1880, i, pp. 361, 397, 439.

† "Courrier Méd.," March 27, 1880.

‡ "Les Globules du Sang." Paris, 1880.

"Lancet," July 17, 1880.

cubic millimetre. In both,* also, the red corpuscles are diminished, this deficiency, in the case of menstruation, being most marked just before the advent of the period (Hunt). Dupérié further asserts that in menstruation great numbers of small red globules are developed.

Fasting renders the red corpuscles more numerous and the white ones more scanty, and the extent of these changes is proportioned to the length of the fast. It seems possible, however, that the increase in number of red cells is not real but apparent, being caused by a progressive absorption of the blood serum, which would have the effect of crowding more and more cells into one cubic millimetre of the fluid. The ingestion of food, on the other hand, diminishes the red corpuscles and increases the white ones, so that the latter may be relatively two to three times as numerous after a meal as before (Hirt). There is, however, a discrepancy between observers as to what sorts of food promote the development of the white corpuscles, some claiming that an albuminous diet is the most efficient in this regard, while Dupérié asserts that vegetables and milk are the only food-stuffs which act in this manner.

Other conditions which may alter the number of the blood corpuscles, but whose action has been but little studied, are sweating, purging, and other alterations of the bodily state. The same may be said of the influence of the season, to which some effect has been ascribed. Our knowledge is more definite in regard to a fact which Kostjurin † has been instrumental in demonstrating, that any agent which retards the circulation will produce a diminution in the blood corpuscles at the spot where the retardation is induced. This fact partly explains the variation exhibited by blood taken from different situations. Thus, this same author found a difference of 250,000 to 1,000,000 erythrocytes in a cubic millimetre between the blood derived from the supra-clavicular region and that taken from the balls of the toes. In the latter situation the circulation is naturally more retarded than in the former, hence the comparative poverty of the blood in corpuscles. The obstruction to the blood-flow, in this instance caused by the anatomical disposition of the parts, in other cases may be due to cold and other external agencies which cause contraction of the vessels and retardation of the current. So marked is this relation between the rapidity of the current and the number of corpuscles that Kostjurin believes that it will be possible to determine either one of these factors when the other is known. Such a mathematical relation, however, if it exists at all, must apply either to the large vessels alone or to the capillaries alone, for there is no such discrepancy between the number of corpuscles in the arteries and the capillaries as the enormous difference in the rate of circulation in these vessels would indicate. Perhaps the difference in the rate of circulation of venous and arterial blood will explain, on this principle, the preponderance of red corpuscles in the former; or, again, the excess may be apparent only, and due to the loss of serum in passing through the capillaries. There are, however, certain portions of the vascular system, especially the splenic, portal, and hepatic veins, which exhibit an unusual relation between the number of red and of white corpuscles. Such anomalies are not to be explained on any physical principle; indeed, as we shall see, they rather form an argument for the existence of a distinct physiological process—the production of new corpuscular elements. To this point, as well as to the changes in number of blood cells induced by therapeutic agents or by morbid processes, we shall return hereafter.

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* Ingerslev ("Centralbl. f. Gynäk.," iii, 1879, p. 635) denies any decrease of red corpuscles in normal pregnancy.

† "St. Petersb. med. Woch.," Oct. 9, 1880.

In regard to the hæmatoblasts, Hayem gives their usual number as 225,000 in a cubic millimetre. The alterations, if any, to which their number is subject, under normal conditions, have not yet been satisfactorily studied. In convalescence from severe diseases, when they are needed to repair the damage done to the red blood corpuscles, they are poured out, according to the same author, in considerable numbers.

Size.—The determination of the size of the erythrocyte is a problem upon which, probably, more labor has been expended than upon any other single subject in histology. The reason for this is evident. It has been thought that every animal possessed a corpuscle of characteristic size, and that, therefore, any sample of blood could be immediately identified on measuring the corpuscles which it contained. If this theory is correct, it will be quite possible for us to give a definite answer when asked whether any given fluid or stain is or is not human blood. Now, it is just this question that every physician is liable to be asked in the courts, and it becomes, therefore, a matter of universal interest to know how the answer shall be made. Not merely professional reputation, but a human life itself, may depend upon our decision. To rightly acquit ourselves of such a grave responsibility, we must determine, as accurately as possible, how much truth there is in the theory indicated. To do this requires the resolution of the following questions:

1. Is the human blood corpuscle, when of normal size and sub-

jected to normal conditions, liable to be confounded with that of any other animal?

2. Can the size be altered by the conditions under which the examination is made?

3. Are there any other corpuscular elements in the blood which can be confounded with the blood cells of other animals?

We have endeavored to collect in a brief space what has been done toward the elucidation of this problem.

Beginning with the older microscopists, who gave values ranging from $\frac{1}{6000}$ to $\frac{1}{1000}$ of an inch (Young and others), we come down to the much more accurate determination made by Gulliver, which has been received up to the present day. Other measurements, however, were taken, differing from his in a greater or less degree. To reconcile these conflicting observations, a number of the best histologists have gone repeatedly and carefully over the whole ground, in the hope of fixing some standard measurement, which should be accepted as final. The difference in result, obtained by the most competent investigators, shows that no such standard exists. Woodward,* who has given the subject careful study, concludes that the size varies in different cases in much the same way that different men vary in height, there being an average size to which most approximate, while the extreme limits, on either side, are separated by a pretty wide interval. The averages themselves are variously given, as the following list will show:

Observers.	Diameters in μ.†
Ranvier	7·0
Kölliker	7·05
Flint	7·25
Robin	7·3
H. Schmidt	7·4
Hayem and the more recent French authorities	7·5
Welcker	7·74
Gulliver	7·95
Woodward (three specimens)	8·0, 8·25, 8·3

The extreme limits between which the diameters of the corpuscles may range are, probably, 4·5 to 10 μ. In the same specimen of blood, all sizes included within these extremes may be detected; at the same time, the very large and very small cells will be rare, and the number of cells will increase in proportion as their size approaches the average. This is well shown in the experiments conducted by Richardson, of Philadelphia, during the Centennial. He made 1,400 measurements of corpuscles taken from men of fourteen different nations, and obtained the following results: Average diameter, 7·9 μ; maximum, 9·15; minimum, 6·35; 1,158 measurements, or 83 per cent. of the whole, lay between 7·4 and 8·4, while only seven or eight reached the minimum limit, and ten the maximum.

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* "Med. Record," vol. 17, 1880, p. 131.

† μ = a micromillimetre = $\frac{1}{1000}$ mm.

Most of the corpuscles, therefore, are pretty uniform in diameter, and, if a relatively large mass of blood is under observation, there will be little difficulty in fixing the size within narrow bounds. But, even if we have thus precisely determined the average size of the corpuscles in the specimen before us, can we still assert that this specimen is not taken from some other animal than man? We can not do so, and for the reason that in certain of the domestic animals—the cat, dog, horse, ox, and sheep—the average diameter of the corpuscles is so near that of man that the difference falls within the limits of ordinary variation, or even within the range of observational error. Since the corpuscles in these animals differ in no other respect from those of man, a variation in diameter amounting to only one or two μ can not be held as sufficient ground for differentiation. This would be true even if the corpuscles of these animals and of man varied very little from their average value. But, as a matter of fact, they vary considerably, and a further element of doubt arises from our ignorance of how far this variation may extend in the case of the animals in question. And the doubt becomes very great, indeed, when we have only a few cells under observation, and are not able to say whether they represent the average of the blood to which they belong. We feel justified, therefore, in answering the first question of our original problem in the affirmative, asserting that the blood corpuscles of man can not, even under normal conditions, be distinguished with certainty from those of certain of the domestic animals.

But this is not all. The blood which is submitted to the expert for examination is generally in an abnormal state. It has been dried upon wood or steel, or, perhaps, has been soaked up by linen, and may require special means for its extraction. Now, if, repeating the second question of our original problem, we ask if the size of the corpuscle can be altered by these conditions to which it is exposed, we again get an affirmative answer. Struve,* who has been investigating this matter recently, shows that a red corpuscle which has been extracted from a blood-stain by the use of oil of almonds may have only one half the usual diameter, and that other substances exert a similar action. It is not, indeed, impossible that part of the difference in the estimates of the normal size may have been due to differences in the menstrua employed. The effect of drying in a thin layer seems to be the enlargement of the red cell. Such changes, the degree of which has not been satisfactorily determined, preclude us from saying what is the normal size of any corpuscle examined under these circumstances.

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* "Arch. f. path. Anat. u. Physiol. u. f. klin. Med.," January, 1881

Of course, there are many animals from which the blood of man can be differentiated. Thus, the human corpuscle is distinguished from that of any oviparous animal by the oval shape and nucleation in the case of the latter; from that of the camel by its shape; and from those of some other mammals by the size. But, as the animals coming under the last category are not domestic, and would scarcely occur as alternatives for man in a medico-legal case, we may give it as a general rule that the size of the human blood corpuscle is not sufficiently characteristic to admit of its being used as evidence before a court of law.

The central depression of the erythrocyte is usually about 6 μ in diameter (Arndt). Few observations have been made toward determining the thickness of the disk, although, in general terms, it is stated as about one fifth the diameter (Dalton). Welcker has endeavored to compute the volume of the corpuscle, and gives as an average figure 72 cubic μ. This, of course, can not be regarded as anything better than an approximation;* and, in any case, the volume must vary considerably in different corpuscles, and, even in the same corpuscle, must be altered from time to time by the imbibition of water and by other agencies.

The spherical cells which are found here and there in the blood are 5 or 6 μ in diameter. The microcytes, or elementary corpuscles, vary from 5 μ down to an almost inappreciable size. The hæmatoblasts are usually 1·5 to 3 μ in diameter, but may go as high as 4, 4·5, or even 5·75 μ (Hayem). It may be asked whether these small forms might not furnish an additional source of doubt in the distinction of human from animal blood. This, however, seems quite unlikely, as in this case there is a real difference in physical character, which should remove any ambiguity that the similarity in size might produce.

The white corpuscles present considerable variations in magnitude. Arndt, who, as already mentioned, makes three classes of leucocytes, assigns to the members of the first and second sets diameters of 3 and 6 μ, respectively; while the third class (ordinary leucocytes) have a diameter of 10–14 μ, or even more. The "eosiniphile leucocytes" of Ehrlich measure from 15 to 20 μ.

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* Yet it is confirmed by the result of a comparison of the weight of the corpuscle with its specific gravity: the former may readily be calculated to be 75 to 80 $\mu\mu$ gm, the latter varies from 1088 to 1105; the quotient, which, of course, represents the volume, is about 70 cubic μ.

Physical Characters.—It is a familiar fact that, under ordinary powers of the microscope, the red corpuscles appear as perfectly homogeneous bodies. If, however, a very high power is employed (say 1,500 or 2,000), a peculiar differentiation of structure may be made out, concerning the exact nature of which there has been some difference of opinion. Many excellent histologists, particularly Klein,[*] of London, believe that this appearance is due to the presence of a reticulum of delicate fibrils, interlacing in every direction, and containing in its meshes the basement substance of the cell. (See Fig. 4.) Satterthwaite,[†] however, says that this arrangement is not present in fresh preparations, and Hayem[‡] looked in vain for it in corpuscles which had been decolorized by a stream of distilled water. Both Arndt[#] and Pouchet[‖] regard the fibrillation as an optical illusion, the former ascribing its apparent presence to granules evenly diffused through the corpuscular mass, the latter thinking it due, in the nucleated corpuscles at least, to a partial division of the nuclear matter.

The presence of an investing cell-membrane has also been claimed for the red corpuscles; this especially by Arndt and by Richardson, of Philadelphia. But the reasons adduced in support of this view are not very conclusive, and, consequently, their belief is not shared by most microscopists. Arndt himself acknowledges that this membrane is acquired by a few cells only, and is not present except in those which are old and are undergoing retrograde changes. There

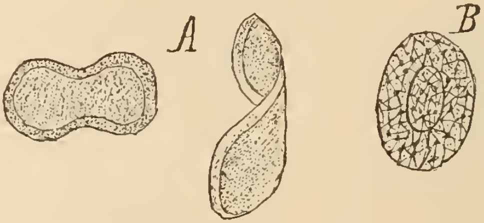

Fig. 4.—A, membrane of the red corpuscle (Arndt). B, reticular structure of a nucleated red corpuscle (Klein).

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[*] Klein and Smith, "Atlas of Histology."

[†] "Arch. of Comp. Med. and Surg.," April, 1880.

[‡] "Gaz. Méd.," Nov. 1, 1879.

[#] "Arch. f. path. Anat. u. Physiol. u. f. klin. Med.," January, 1881

[‖] "Jour. de l'Anat. et de la Physiol.," xv, 9.

is, therefore, little ground for believing in the existence of a true cell-wall; at the same time it is not unlikely that there is more or less condensation of the corpuscular substance at its periphery. The observations of Stricker and others, who describe the erythrocyte as consisting of a large central body surrounded by a very narrow concentric envelope of a different consistence, appear to favor this conclusion.

The erythrocytes are sometimes said to possess a nucleus. The presence of nucleated red corpuscles in the inferior animals, in the human fœtus, in the bone-marrow, during extra-uterine life, and, in some cases of disease, in the general circulation as well, has lent some degree of plausibility to this supposition. Single cases have been reported of their occurrence in normal human blood (Huxley, Wharton Jones). Harting (1847), and more recently Böttcher, have obtained the appearance of nucleation by treatment with corrosive sublimate. As, however, this agent does not have the same effect upon all the corpuscles, Böttcher divides the latter, according to the reaction which they exhibit, into three sets: the homogeneous, the granular, and the nucleated. But these opinions have not gained much foothold with scientific men generally. It is urged that the nuclei never appear spontaneously, and that the means employed for their demonstration involve violent changes in the corpuscular structure. Moreover, Dowdeswell* has pointed out that, by the addition of some reagents, a five-per-cent. solution of chromate of ammonium, for instance, an excentrically-placed dark spot is produced, answering very exactly to the description of Böttcher's nucleus; but here the appearance is due solely to a folding of the edge of the disk upon itself at some portion of its circumference. Fig. 5, taken from our own observations, shows the destructive action of a weak solution of corrosive sublimate (Hayem's

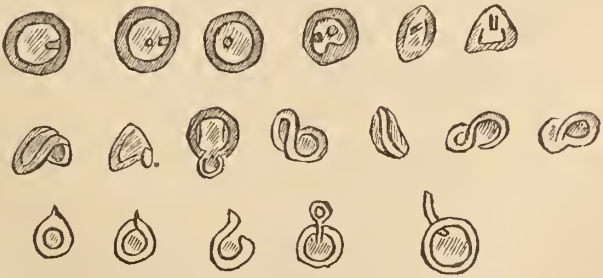

FIG. 5.—APPARENT NUCLEATION, INDUCED BY THE ACTION OF CORROSIVE SUBLIMATE.

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* "Quart. Jour. of Microsc. Sci.," January, 1881.

fluid) upon the corpuscles, and the appearance of nucleation which is thereby induced.

The large central core of the corpuscle, described by Stricker, is by some called a nucleus; but Fellner* gives good reasons why it should not be. The most convincing proof is that it is present in the fetal corpuscle along with a nucleus, and persists after the disappearance of the latter. As before mentioned, some of the smaller red corpuscles are granular in appearance. The hæmatoblasts, if we are to follow the description of Hayem, are perfectly homogeneous, and do not possess a nucleus.

In the leucocytes, as in the red corpuscles, histologists have described a fine reticulum inclosing the protoplasm of the cell. The granules, seen with a moderate magnifying power, represent the nodal points of the reticulum. Real granules of much more minute size do exist, scattered through the interspaces of the meshwork. This view has received the same support and encountered the same opposition as the similar theory of the constitution of the red cells. Arndt,† although he does not accept it, is equally opposed to considering the leucocytes to be mere masses of undifferentiated protoplasm. He describes the adult white corpuscle as consisting of a ground-substance, containing a number of minute vesicular bodies, each of which, in turn, incloses a dark granule. The smaller forms of leucocytes are for him the early stages in the development of the large variety; they are, consequently, less completely differentiated, and are either granular, faintly stippled, or homogeneous.

Most authors allow that the white corpuscle is nucleated. In the smallest varieties the nucleus is single; in those of medium size, which are tinged with hæmoglobin, it is single or double; in the large forms, as they ordinarily occur, it is generally multiple (Hayem). But there are authors who deny the existence of a nucleus except as a post-mortem product. Obrastzow,‡ for instance, maintains that the leucocytes contain finely granular "nuclear matter" scattered evenly through their substance; that, on withdrawal from the circulation, this nuclear matter coagulates faster than the protoplasm of the cell-body, and so forms a nucleus; but that, by appropriate means, the process can be reversed, so that the protoplasm coagulates first, and in this case no nucleus is formed. A somewhat similar theory has been defended by Arndt,# Norris,‖

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* "Med. Jahrb.," 1880, 4.

† "Berl. klin. Woch.," 1880, No. 29.

‡ "Centralbl. f. d. med. Wissensch.," 1880, No. 24.

"Arch. f. path. Anat. u. Physiol. u. f. klin. Med.," 1879, p. 1

‖ "London Med. Record," January, 1880.

Flint,* and others. Often these observers go further and say that the oval red cells of birds and amphibia are non-nucleated in the normal condition. This idea was originally broached by Moleschott.† From such a point of view the erythrocytes of these animals and of mammalia do not differ in constitution; they both contain nuclear matter diffused through their substance, the only difference being, that in the former class of animals the nuclear matter is readily coagulated, in the latter it is coagulated with difficulty or not at all.

In spite of the plausibility of this hypothesis, we must own that, to our mind at least, it does not carry conviction of its truthfulness. The nucleation of the white corpuscle is a phenomenon so universally observed and so readily obtained that it seems hardly fair to ascribe it to a post-mortem change. It is often apparent without the action of reagents, and, above all—and this applies not only to the white corpuscle, but also to the oval red cell of the amphibia—it is observed in the vessels of the living animal. We think, then, that we are justified in retaining the nucleus as a normal feature in the constitution of the leucocytes.

(*To be continued.*)

THE DEVELOPMENT OF THE EYE.‡

By WILLIAM C. AYRES, M.D.

In discussing the development of the eye, we necessarily have to make use of many of the technical terms of embryology; and, since a clear conception of these is requisite to the appreciation of the subject, I have thought it advisable to commence at a period far in advance of that at which the organ of vision makes its first appearance.

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* "Text-Book of Physiology," 1879, p. 14.

† Müller's "Arch.," 1853, Heft 1.

‡ A series of articles will appear in the successive numbers of this Journal which will include the development of all the tunics of the eyeball, and also their congenital defects. The drawings have been made from specimens in my own collection for the most part, and for the reproduction of some of them I am indebted to my friend Dr. Le Boutillier, clinical assistant at the New York Ophthalmic and Aural Institute.

It will be noticed that frequent reference will be made to the embryo of the ox. It is almost impossible to obtain human fœtuses in such quantities and varieties as to present all the stages of formation, and, as it is considered that the young ox is almost precisely the same as the human fœtus in its earliest stages, I have substituted the one for the other, since my collection of the one is extensive and of the other defective. The bulk of these communications I have already given in a course of lectures delivered at the New York Ophthalmic and Aural Institute.

This part of the subject must, however, be very briefly dealt with, since a minute description of other conditions than those which have a direct or indirect relation to our subject, either as giving us formative material or terminology, would be too great a deviation from the course I have found it advisable to pursue. A further discussion of such parts I must, therefore, leave for works on general development.

Within the egg-shell there exists a membrane, called the *membrana testæ*, which lines the shell in its whole extent. On closer examination, it can be divided into two subordinate layers: an external, which is stronger and coarser, and an internal one, which is delicate and smooth. As long as the egg lies in the uterus, and also immediately after it has been laid, these two membranes lie in contact with each other; but as soon as the egg has become cool they separate near the blunt end, and an air space is formed between them which continually increases in its dimensions. They are both lamellar in structure, and are composed of fibers anastomosing freely with one another; which fibers, by appearance and chemical reaction, show their nature to be that of fibrous connective tissue.

Near the yolk, according to Kölliker, the white of the egg also forms itself into a membrane (membrana chalazifera), which is converted into two spiral ligaments at the ends—the so-called suspensory ligaments. That which runs in the direction of the sharp end reaches farther out and becomes attached to a thicker portion of the white, while that in the other direction lies free and floats in a fluid mass.

The yolk of a fecundated egg differs much from one that is not so, and it has, therefore, received a special name. The formative portion, at any rate, is termed the *blastoderma*. This blastoderma contains large globules, which exhibit all the characteristics of cells and nuclei. It is from 3·5 to 4·1 millimetres in diameter, according to Kölliker, and is composed of two layers, the outer one of which is called the *ectoderm*. This forms a continuous layer over the whole blastoderma, but is thicker in the middle than at the sides. In the middle it is composed of several layers of cells, while in the sides these are reduced to a single row, the cells showing a granular nucleus.

The inner layer of the blastoderma is called the *endoderma*. In the majority of cases this membrane forms an inner lining to the outer one, but sometimes it is not so well developed in a newly-laid egg, and only exhibits isolated elements. It is always thickened at the edge, and forms a distinct growth all around the blastoderm. The blastoderm of a newly-laid, fecundated egg is a distinct formation from the white, the two being separated by a sharply-defined contour.

We have seen that in the beginning there were only two layers, but afterward there is formed a third, which is produced directly from the ectoderm by a breaking through of the limiting contour between it and the endoderma, and an increase in cells from the ectoderma. These newly-formed cells run in between the two primary germinal layers, forming a third, which is called the *mesoderma.* Where this formation takes place we have afterward the first appearance of the embryo in the shape of a dark strip of tissue called the *axial plate*, which axial plate runs crosswise of the egg in all instances.

We, therefore, have the cells of the mesoderm, and also the axial plate, formed exclusively from the ectoderm, and only from the middle portion of the germinal layer. The endoderma still runs beneath, and shows only a single layer of cells, as we first found it.

Between the tenth and fourteenth hours, in the chick, this axial plate measures 1 millimetre in length and 0·2 millimetre in breadth. It then begins to develop rapidly in length, but increases slowly in breadth, which is shown by an opaque zone along its whole extent, producing an opacity which is much broader at the end that is to form the head than at any other part. The thin layer then coils over in such a manner as to form a closed tube for the head, and where the two edges meet and are joined together we call the line of closure the *suture.* The end of the head still remains open, and two constrictions are found in it, in consequence of which we now distinguish three portions as the divisions of the future brain, viz., the *anterior*, *middle*, and *posterior cerebral vesicles*, the anterior being by far the largest of the three.

We can now take leave of the rest of the body and devote our attention to the anterior of these cerebral vesicles, as it is from this, and this alone, that the material for the formation of the primary ocular vesicle is obtained.

As the object of these articles is to present a history of the development of the eye exclusively, we could have begun just at this point, giving attention only to the changes which occur in later stages, and still have made the subject complete in itself, as the line of demarkation between the two periods, as far as the eye is concerned, is as sharply defined as possible. Thus far, we have seen that there is no tissue which will give us any clew to our subject, whereas later we have a condition of things brought about by the production of new formations, which, by changes in themselves, give rise to a continuous train of events, at the termination of which the eye results as a perfect optical instrument.

The most natural course now seems to be to take up the organs in the order in which they make their appearance and follow them through their individual changes, at the same time mentioning incidentally the effect the other members will have upon them by virtue of their proximity or simultaneous development.

We have seen that the brain has been formed, in the shape of a cavity called the cerebral vesicle, and that this vesicle divides itself into three distinct portions. We then come to a time when the walls of the anterior one of these are framed into a substantial condition, and consist of several rows of cells placed the one over the other, which cells are oval in shape, with their long axes perpendicular to the plane of the wall of the embryonic brain. At this time the development of the eye begins, and our first section will be devoted to the initiatory stages in the formation of the retina, or the primary ocular vesicle.

THE PRIMARY OCULAR VESICLE.

The most important and interesting discovery in the whole history of the development of the eye was made when K. E. von Baer pointed out that the primary ocular vesicle stood in direct communication with the cerebral vesicle, and was formed from a reduplication of its walls. The exact time at which this reduplication begins is indeed hard to determine; but in the case of the chick it would seem to be about the end of the thirtieth hour, or in the embryo of the ox when this animal has reached the length of from five to six millimetres. In the ox, we find that, just before this formation, the head presents an advanced condition, where the outer layer, or ectoderma, the middle layer, or mesoderma, and the inner layer, or endoderma, are easily distinguishable. The walls of the cerebral cavity, which are formed from the last-mentioned germinal plate, are of peculiar interest to us. As the head bends over on to the breast, we notice an increase in the inner germinal layer just opposite to the future situation of the eye. This increase is the first formation which is noticeable in our organ.

It appears at first to be a slight thickening and consequent elevation, whereby a nodule is formed on the endoderma, which projects outward into the tissue of the neighboring germinal layer, the mesoderma. This extended wall is composed of several layers of cells, the one over the other, placed exactly in the same position as in the brain.

The nodule is not developed forward in a solid state, but presents the appearance as if the sides of the cerebral vesicle had been forced in such a manner as to be bent upon themselves, and made to form a kind of loop on either side, representing the two primary ocular vesicles (see Fig. 1). These loops develop farther into the tissue of the mesoderm, while at the same time the fissure produced by the removal of the primary ocular vesicles continually becomes narrower. The apex of the displaced cylinder begins to be widened out, so as to form a globe (see Fig. 2). This globe is the vesicle proper, and is destined to form the retina, in a manner to be described hereafter. The walls of the communicating stylus which connects this globe to the cerebral vesicles then approach nearer to each other, until they meet and form a solid stem, which stem, by a further transformation, will form the optic nerve. This whole growth, composed of stylus and primary ocular vesicle, develops farther and farther into the mesoderm, displacing its tissue in its progress, until it has almost reached the outer layer of the head, the ectoderm, as in Fig. 2.

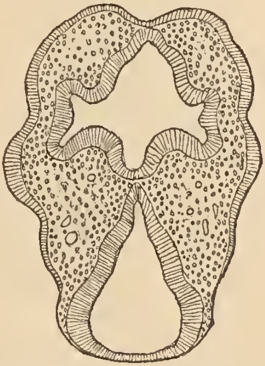

FIG. 1 represents a section through the head of an ox embryo, about four or five millimetres in length. It is cut perpendicularly to the cerebro-spinal axis, so that the division of the embryonic brain into anterior, middle, and posterior cerebral vesicles is not indicated. They do not lie in the plane of the section. The upper cavity in the figure is the anterior part of the brain. The outer double contour is the ectoderma, or external germinal plate; the lighter part, filled with cells, is the tissue of the mesoderma; while the inner double contour represents the walls of the brain, and is styled the endoderma. The two bud-like formations, which are portions of the endoderma, are the primary ocular vesicles, being the first stage in the production of the retina. They are the first formations of the eyes.

Some authors contend that the apex of the primary vesicle develops so far out into the mesoderm as to push this tissue entirely aside, and lies for a short time in immediate contact with the outer layer; others again declare that this contact is never attained—on the contrary, that there always exists a layer of tissue between them. According to my own specimens, this latter view is undoubtedly the correct one, as I have always been able to detect a thin, semitransparent layer of the mesoderm which had never been broken; and this layer contains at all times both cells and intercellular substance. The importance of this layer will be recognized when we study the formation of the capsule of the lens, the vitreous humor, etc. Notice, then, that the retina has never been detached from the brain, nor does it ever become so, the original tissue of the walls of the cerebral vesicle being transformed into the retina only by a selective process of development.

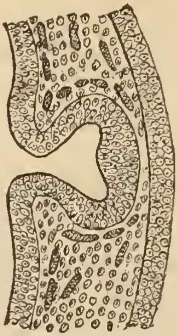

Fig. 2.—The double contour to the right is the ectoderma, which is to produce the lens and the epithelium of the cornea. The clear tissue immediately interior to this is the mesoderma, or connective-tissue layer. The dark figures in it are embryonic blood-vessels in the mesoderma. The irregular double contour to the left is above and below parts of the original cerebral vesicle, while the bend is a further development of the primary ocular vesicle, which has pushed away the tissue of the mesoderm, and almost reached the outer layer of the head. Between these two can be seen a small stripe of mesoderma, upon the existence of which I place the greatest stress.

The next step which we notice toward a further production of the eye is, that the primary ocular vesicle begins to be pushed in at the pole of the globe farthest from the brain, so that the upper part is made to become concave outward, the inner hemisphere retaining its original shape. A cross-section of the parts in this condition will then present the appearance shown in Fig. 3; and when in a stage a little more advanced, if the section does not pass through the stylus for the optic nerve, there will be two semicircular figures, the one lying inside the other, both having their concavities turned outward. Both of these taken together are known as the secondary ocular vesicle. *The outer layer is destined to form the entire retina*, except the black pigment epithelium. The inner one of them, which is nothing else than the original inner hemisphere of the primary ocular vesicle, forms the epithelium just referred to—all of which we shall consider more fully when we come to the study of the retina itself.

The first to point out this association of the primary and secondary ocular vesicles was Schoeler, and all authors who have written on this portion of the subject of development since his time have only confirmed his observation. In the beginning, the two layers of the secondary ocular vesicle are equal in thickness; but, while the inner one increases in volume, the outer one diminishes, this difference becoming very obvious in a short time. While the inner one is going through all of those changes which develop it into the complicated structure of the retina, the outer one is becoming simpler in form, and finally assumes the shape of a single row of cells, as will be seen on examination of the retinal pigment epithelium of the adult eye.

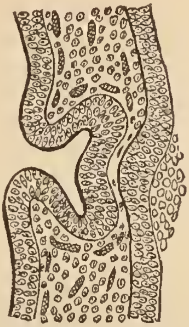

FIG. 3.—All the parts of this figure are the same as in Fig. 2, with the exception that, just in front of the eye, the external layer is thickened and bent inward, which represents the beginning of the formation of the lens. We therefore see that the lens is epithelial tissue. The primary ocular vesicle is also bent inward to admit of the receding lens; but between them we still find a stripe of the mesoderma.

The cause of the sinking in of the primary to form the secondary vesicle we shall see more plainly when we study the formation of the lens; and, since the lens is instrumental in bringing about this change, we will first bestow our attention upon that structure, and afterward study the retina in its further development.

THE LENS.

At the time when the primary vesicle is still round and entire or before the secondary vesicle has begun to form, it stands in close proximity to the ectoderma (Fig. 2). We have already remarked that, although these two membranes approach very close to one another, they are always separated by a semi-transparent layer of the mesoderm, and that this layer always contains cells (see Fig. 2).

In front of the outer pole of the sphere of the primary vesicle a slight thickening of the ectoderma begins to take place. At the same time that the ectoderm becomes thickened, it recedes from the surface of the head, so as to leave a shallow depression behind it (see Fig. 3). The ectoderm is at this time composed of several layers of round or oval cells. The remainder of the outer layer, laterally from the place where the thickening of the ectoderma has taken place (and this thickened part has moved inward), is pushed toward the anterior pole of the eye, so as to close up the depression. Here they meet, but in the mean time that portion of the ectoderma which has sunk into the hollow of the secondary ocular vesicle has become a closed sphere, which is now attached by a stylus to the external layer, just as the primary vesicle was to the brain by the stylus for the optic nerve (see Fig. 4).

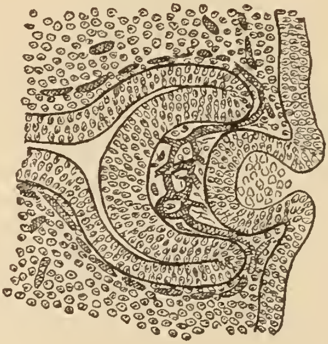

FIG. 4.—An advance of the condition shown in Fig. 3. The epithelium in front of the eye has been formed into a vesicle, which still hangs to the epithelial layer, showing how the lens takes up its position in the interior of the eye. The anterior wall of the primary ocular vesicle is doubled back, when all of this tissue which has had its origin in the endoderma is called the secondary ocular vesicle. The blood-vessels run in between the lens and the secondary ocular vesicle, and into a tissue behind the lens, which represents the vitreous.

This lens vesicle, of course, has pushed before it the layer of mesoderm which was between it and the ocular vesicle; and has also carried the anterior wall of the primary vesicle backward, thereby producing the secondary vesicle.

The mesoderm now comes in behind the lens vesicle, surrounding it completely, except at the stylus, which still attaches it to the ectoderma, so as to leave no space unoccupied by tissue. The mesoderma at this place contains cells and blood-vessels. The stylus of the lens is finally broken through and the lens vesicle is closed up, when it forms a hollow sphere. The ectoderm also closes over the fissure which was produced in it by the removal of a portion of its tissue to form the lens, and again becomes continuous (see Fig. 5). The mesoderm also pushes forward from each side into the space in front of the lens previously occupied by the stylus, and becomes continuous on all sides, furnishing the basis from which the tissue of the cornea is to be formed.

Let us now follow the fate of the lens vesicle after it has become detached from the ectoderm, and is an independent member in itself. Its wall is made up of several rows of round or oval cells, the one over the other, precisely as they were in the ectoderm, and is equally thick in its whole circumference. Inside the lens vesicle there exist round granular cells with nuclei, but the significance of these is not known, since they do not take any further part in the formation of the lens body.

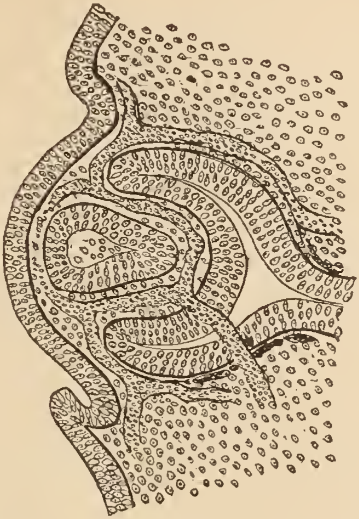

FIG. 5.—The parts are the same as in Fig. 4. The lens has become detached from the outer layer, and is a closed vesicle. The vessel which penetrates the walls of the secondary ocular vesicle is the central artery of the retina. It enters the vitreous and anastomoses with the vessels which come in from above. How it gets into the eye, we shall see in a subsequent section.

The first publication on the condition just described came from Huschke,* and in it he fully sets forth the origin of the lens from the external of the three germinal layers. He considers the further development of the lens material to be a differentiation of the substance obtained as above described. Ammon † attacks this opinion as to its formation, and declares it to be a solid body, denying the existence of an opening in it at any time. Many other authors, since the time of Huschke, including Bischoff, Gray, and Schoeler, have also denied his statements as to its histogenesis; but Vogt ‡ has studied this question most carefully, and not only sustains the idea of Huschke as to the mechanism of the formation of the lens vesicle from the ectoderm, or outer layer, but declares most emphatically that the lens fibers have their origin from the cells of this epithelial capsule. Meyer * has also shown that each lens fiber has its origin from one single cell of the wall of the lens vesicle, contrary to the opinion of Valentin and Harting. Kölliker † confirms the opinion of Vogt, as regards the salmon, in his observation on the inkfish. Remak also gives a detailed description of the processes in the development of the lens, and writes that that portion of the ectoderma which stands just in front of the primary ocular vesicle becomes thickened and is transformed into a semi-circular cavity, which sinks deeper in from the surface, becoming detached finally, when it presents a closed cavity, which he styles the lens vesicle. He makes this distinction, however, that in the case of the fishes the epithelial layer at this time is much more developed than in birds, and, while the whole ectoderm is concerned in producing the lens vesicle in the case of the fishes, in birds it is formed from the inner layer of the ectoderm, which is here composed of two distinct layers. Kölliker does not consider this division of the ectoderm into two distinct layers possible, the lens being formed only from the inner one; but the fact stated by Remak is fully substantiated by Barkan, viz., that this process really takes place.

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* Meckel's "Archiv," 1832.

† "Ztschr. f. Ophth.," 1832.

‡ "Embryology of the Salmon."

Goette ‡ describes the lens, in the case of the toad, as being developed from the inner, *active*, layer of the ectoderm, in a solid form. Babuchin, Kessler, and Lieberkühn agree with Remak, and confirm all his statements in the case of the chick. J. Arnold also places his observations in accord with those of Remak, and states that the lens is formed as a hollow vesicle from the ectoderma, and that this whole germinal layer is active in its production, Goette being the only author who declares the lens to be formed in a solid state.

Allow me to insist that in the case of the human embryo the lens vesicle is composed of oval-shaped cells, and is round and hollow. In its cavity large granular cells are found, which contain nuclei. In the beginning the walls of the vesicle are equally thick in its whole circumference, but at a later period the posterior wall begins to increase in volume, which increase occurs in the case of the ox when the embryo has attained a length of fifteen millimetres. The central space has still the granular cells already mentioned, but the line of demarkation between them and the cells of the walls becomes more and more distinct. The granular cells do not take any part in the formation of the lens, but disappear sooner or later, while those of the inner wall of the vesicle begin to be lengthened and grow longer and longer, until they become transformed into the fibers of the lens (Fig. 6).

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* Müller's "Archiv," 1851.

† "Ztschr. f. wissensch. Zool.," Bd. vi.

‡ "Arch. f. microsc. Anat.," ix, 1873.

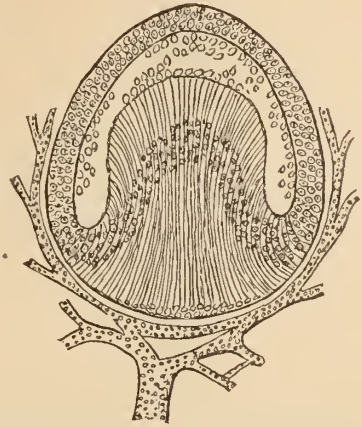

FIG. 6.—A section through the young lens. The double contour above is the original anterior wall of the lens vesicle. The cells in it are those which have been derived from the ectoderma. A little below the equator of the lens these cells begin to lengthen, and form themselves into fibers, each cell producing one lens fiber. They have not reached the inner side of the anterior wall, and the round bodies in the spaces between them represent the débris which has been deposited from the fluids of the uterus. Notice that the nuclei occupy a locality nearer the top than the bottom of each fiber. The zone of these nuclei is the nuclear zone of Horner. The lens is represented without its hyaline capsule, which is a later formation. Below is the hyaloid artery, communicating with the vessels from the front.

While this lengthening of the cells of the posterior wall is being brought about, those of the anterior become smaller, and are finally transformed into the epithelium of the anterior capsule. The cells which are nearest to the posterior pole of the lens are more rapidly developed than the remainder, and the whole wall then presents a strongly convex surface, with its convexity pointing outward (see Fig. 6). This concavity continually encroaches upon the large, round, granular cells of the interior, which seem to be in the center by a mistake of some kind, until it reaches the anterior capsule, and the internal cells disappear. The most interesting portion of a developing lens is the part where the epithelium ceases and the fibers begin, shown in Fig. 7. The epithelium continues down to the equator of the lens as such. The cells immediately below this then commence to be lengthened so as to be transformed into fibers in the following manner: The cells immediately behind the equator lengthen and bend sharply around until their ends come in contact with the anterior capsule. As this lengthening continues, the development takes place from the inner end more than from the outer, and consequently the nuclei are raised up toward the anterior capsule, and, since the individual fibers have to elongate, to meet the anterior capsule, in accordance with their distance from the posterior pole, and since the posterior end of each lens-forming cell is developed more rapidly than the anterior, the nuclei become raised up regularly and form themselves into a semicircular zone, known as the *nuclear zone of Horner*. The region near the equator of the lens is known as the *formative zone*, as it is this particular part which is to be instrumental in bringing about the peculiarities which distinguish the fetal from the adult lens.

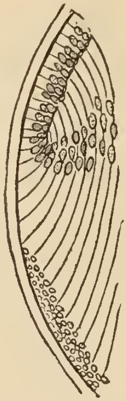

Fig. 7.—A section through a lens somewhat more advanced than that shown in Fig. 6. The fibers have reached the anterior wall of the lens vesicle. The figure is intended to show how the *cells* in the anterior wall merge into the *fibers* of the posterior wall. The small round bodies below represent the débris which has come in behind the lens fibers as they were raised up from the capsule behind. The hyaline capsule is now *in situ*. The zone where the transition of cells into fibers takes place is the formative zone ; only a part at the periphery of the lens is represented.

The direction of the fibers in the middle is a straight line, while those toward the sides are bent with their concavity turned laterally. The cells near the posterior pole, in their transformation into fibers, do not remain with their ends abutting against the posterior capsule, but are drawn away from it, forming a space between. Those just in the middle are more removed than those toward the sides, and there is consequently a triangular space produced, whose apex is directed outward and whose base is turned inward. This space represents what is afterward to be the posterior star of the lens. In this condition the whole lens is more or less round.

Up to this point, the lens fibers have been produced exclusively by the transformation of each cell of the posterior wall into one single lens fiber, but in embryos a litle older, such as that of the ox when thirty millimetres long, there begins a marked increase in the number of the cells or fibers of the formative zone. The lens now appears more oval in shape, whereas before, as we have remarked, it was round. The formative zone is also much higher up than in the case of the round lens. The central fibers are still straight, but are somewhat more removed from the posterior wall, making the triangular space larger. The ends of the lateral fibers become bent around toward the axis of the lens, probably by an increase in the number of fibers and a consequent pressure toward the center.

The central fibers encroach more and more upon the cells which were contained in the middle, and push them into a space near the top, corresponding to that which was formed posteriorly by the removal of the fibers at the posterior pole from the posterior capsule. Both of these spaces represent the stars of the lens. At a later stage, when the embryo is from forty to seventy millimetres long, according to J. Arnold, the posterior triangle has increased much in size, the anterior has diminished, and at this time the lateral fibers are so bent as to present their convexity toward the equator.

J. Arnold also remarks that the existence and significance of these polar spaces can be appreciated only when we study sections made parallel to the surface of the lens. On the posterior surface, in such sections, we find the stars with their rays, two running upward into the lens substance and laterally, and the third running posteriorly. The lens fibers end on these rays, and their ends are broader than those of the rest of the fibers. The fibers near the center are at right angles to the rays, while near the periphery they are oblique.

The same state of affairs will be found at the anterior pole, only the relation is reversed, one ray running upward, while two run to the side and downward. The farther we leave the poles and go toward the periphery, the more these relations become changed, and we consequently meet with fibers that have been cut diagonally in the sections.

In the examination of older embryos, or those of thirty centimetres in length, we find the lens much changed. J. Arnold also gives a description of a lens at this age, and states that the increase in the fibers from the formative zone is much greater. Those lying next to the capsule at its equator are still bent toward the axis, whereas, at a little distance from them, they begin to assume a straight course. Then follows a region, extending inward, in which they assume an S-shape, and after this they change the direction of their concavity and are now concave toward the axis of the lens. This results as a matter of course, since they are convex outwardly at the nucleus, and inwardly at the periphery. The more we approach the axis, the more this bent condition becomes manifest, until the fibers become transformed into those of the nucleus of the lens.

In the mean time the cells of the anterior capsule have been so diminished as to form only one layer, which we at once recognize as the anterior epithelial layer of adults. The anterior and posterior poles are still to be seen, but are smaller, and the ray which runs inward reaches farther toward the center of the lens. The relation of the fibers to the rays is changed only on account of their having become bent. The shape of the lens is more oval the older the embryo, and, indeed, the change continues during extra-uterine life until the age of twenty years.

A short recapitulation would not be out of place for the better understanding of this whole process.

The lens, in its earliest stages, is formed in the shape of a solid mass, which has taken its origin from the whole thickness of the ectoderma. It afterward becomes a hollow vesicle and sinks in from the surface of the head, but the original epithelial cells remain and form the walls of the vesicle. The body of the lens is, therefore, epithelial tissue. In the beginning it is round, and its walls are equally thick throughout its whole circumference. The cells of the wall are oval, and contain nuclei. The formation of the fibers of the lens begins on the posterior wall, and they have their origin in the cells of the walls themselves, which cells become lengthened, and are thus transformed into fibers simply on account of their length. From each cell, with its nucleus, one individual fiber is produced.

The space in the vesicle becomes smaller as this increase advances, and its shape is changed as the developing lens fibers approach the anterior wall. The posterior develops more rapidly than the anterior end of the fibers, and, while the nucleus was originally in the middle, it subsequently assumes a position much nearer the anterior end, these nuclei forming a zone called the *zone of Horner*. This zone begins near the periphery, and runs about half way between the anterior capsule and the transverse axis of the lens.

At a later stage we find an increase in the fibers from the formative zone, as well as an increase in the length of the original lens fibers. The fibers near the posterior pole are raised from the capsule, and form a space for the posterior star. The lens fibers push forward and narrow the cavity of the vesicle, and, coming near the anterior capsule, produce a small space for the anterior star. The fibers in the middle run a straight course, while those at the sides are bent and have their convexity toward the periphery of the lens.

The further changes are brought about by the increase in the number of fibers at the formative zone, where the new ones push the neighboring fibers so as to force them to assume a bent condition with their concavity toward the center. The original straight fibers form the nucleus of the lens. The lens is made more oval in shape by this change. The cells on the anterior wall become fewer in number, and are transformed into the anterior epithelium of the capsule. A new formation of fibers is found only at the formative zone. The central rays of the stars approach the center more and more as the animal grows older. In the young embryo the fibers stand at right angles to the rays, upon which they abut with broad ends. In older embryos the fibers are bent so as to assume an oblique direction to the rays of the stars.

The lens does not present itself in the shape of a perfectly hollow vesicle, as is so often stated; on the contrary, my preparations (Figs. 3 and 4) sustain those authors who contend that it is more or less solid. Its solidity, however, is brought about by a very peculiar condition of affairs, as the mass contained within its wall gives one the idea that it is a kind of débris which has certainly not taken its origin from any secretory action on the part of the lens, but has resulted from an external cause, perhaps by a deposit from the amniotic fluid. This idea is sustained by the fact that these cells are entirely passive in their nature, and take no part in the further development of the lens body. The amount of this mass of débris is by no means a constant quantity; sometimes it fills the entire vesicle, or, at a stage when it is not closed, the cells project far out beyond the level of the head, as in Fig. 3. Such conditions are described by J. Arnold and others, and also there has recently appeared an article on the development of the eye, by Ewetsky, from the Institute in Heidelberg, which represents the examination of four such lenses, in which the débris projects and is too great in mass to be accommodated by the capacity of the cavity of the vesicle.

I do not think it is entirely probable that this mass performs the office of keeping the lens walls distended, so as to allow the fibers to take their proper course in the beginning, and, consequently, at the period when they are the most helpless; but, nevertheless, I have remarked that, in those lenses which were more completely filled by it, the rotundity of the lens vesicle was more complete and the lens fibers had their proper direction. On the whole, such lenses are in a more perfect state, certainly one more conducive to an easier development, than those which are not so completely filled. Besides, this mass recedes more and more in advance of the developing fibers, but at the stage in which they have almost reached the anterior capsule it still exists.

I should hardly think that the lens in such an early embryonic condition could take part to a great degree in an active absorption, and the substance which would result from the breaking down of these globules would then remain within the lens vesicle, and might serve as a kind of cementing material. Besides, at an advanced stage, some of these globules still remain and mark out the position for the stars, which might also be a service set apart for them.

Arnold has drawn this mass, in the stage in which the lens is not yet closed, as being limited anteriorly by a smooth and regular contour, as if there were a kind of membrane which shut it off from the external fluid; but this is not at all the case in our specimens, nor do I conceive that such a condition could be possible, since this would certainly give it a distinct significance in development, and would point to its being a product of the ectoderma, which germinal layer has nothing to do with its formation. He also gives a clear zone in front, and, externally to this zone, a membrane. If this exists, it must come from the ectoderm, and the whole origin would be declared; but, since it is cut off internally from the ectoderm by a distinct contour, I would rather consider the condition which the figure implies as a mistake of the person who drew it, rather than as an idea advanced by the author himself. Ewetsky has drawn it just as we have, in Fig. 3, with the individual cells projecting out into the space external to the head. He has, however, depicted a peculiar condition of the mesodermal layer which has been pushed in with the lens, which none of our specimens show, viz.: the tissue behind the lens does not communicate with the mesoderm, but runs abruptly up to the ectoderm, and terminates there. I would consider this also a mistake on the part of the draughtsman.

In this locality the mesoderm stands in direct communication with the vitreous tissue behind the lens, and also passes into and completely fills the space between the lens vesicle and the mesoderm. This last condition gives us the origin of the tissue from which the cornea is to be formed. It always contains cells, intercellular substance, and blood-vessels, the importance of which we shall see when we study the cornea.

So far, we have only considered the development of the proper substance of the lens; but, since this is intimately connected with a vascular tissue which surrounds it, and is of vital importance to the lens, we shall next examine the parts that are concerned in the production of the lens capsule, and that come from an entirely different germinal layer, viz., the mesoderma.

AMYL NITRITE, A POWERFUL CARDIAC STIMULANT.

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The action of digitalis on the heart was, for many years, invested in doubt, and it was a disputed point between two factions of therapeutists as to whether it was a cardiac stimulant or a cardiac depressant, and it was not until the experimental therapeutist came to the foreground, with his convincing evidence, that this vexed question was finally decided, and the drug placed in its proper physiological classification. The amyl nitrite seemed prone to undergo a similar controversy, for, on looking over the literature on the subject, opinions are found which are as diverse as they well could be, and deductions made which are inconsistent with the results of experiments, and contrary to facts revealed by a more thorough consideration. Wood ("Therapeutics," 1879, p. 348), after studying carefully the experimental papers accessible, concludes that "the whole evidence seems to show that the sudden, thumping, rapid stroke of the heart which is so clearly produced by the nitrite of amyl in man is due, at least in part, to a depression of the inhibitory cardiac nerves"; and, in a previous paper, he gives as another factor the diminished oxidation the nitrite causes, and a thrill of impending suffocation and accelerated pulse due thereto; but this will be referred to more fully later in my paper.

While this statement is in the main correct, because there can be no doubt that the nitrites both depress the inhibitory apparatus and diminish oxidation, yet I believe that there is still another and more important factor, therapeutically, concerned in this increase of the heart's action, as was stated in a recent paper on the potassium nitrite ("Am. Jour. of the Med. Sci.," July, 1880), in which I claimed that the nitrites, in small or moderate doses, acted as *direct* cardiac stimulants, and, moreover, gave the results of a series of experiments with the above-mentioned salt, and endeavored, while discussing its physiological action, to clearly show wherein the deductions of certain observers of the action of the amyl compound had been erroneously drawn, and why the results of certain of the experiments undoubtedly corroborated my belief. I have accordingly resumed a discussion of the subject and have carefully reviewed the accessible papers in this relation, and will consider the evidence deduced under two heads—physiological and clinical.

Referring to the physiological papers, we find that Pick (" Centralbl. f. d. med. Wissensch.," Berlin, 1873, No. 55) declares that it causes a relaxation of the heart muscle, and that the accelerated action of this organ is, in part at least, due to the opening of the vascular channels; that Filenhe (Pflüger's " Archiv," Bd. ix, p. 490), by the result of a single and very interesting experiment, indicated that the increase of the cardiac beat was due alone to a depression of the vagi nerves, for it was found in this experiment that after section of these nerves, an electric current being employed by direct application to the peripheral portion of the severed trunks, of such a strength as to lower the pulse rate to the normal, the increase did not occur as in normal animals; that Mayer and Friedrich (" Arch. f. exper. Path. u. Pharm.," 1875, v, p. 55) in a different way corroborated Filenhe's testimony, for they observed that sudden asphyxia did not slow the pulse after the administration of the nitrite as it did in normal animals, and, moreover, when they pressed the carotids, and prevented the blood from gaining access to the cerebral arteries, the increase did not occur, nor did they find any diminution of the pulse rate by endeavoring to induce a reflex inhibition of the heart by irritating a sensory nerve.

Wood (" Am. Jour. of the Med. Sci.," 1871, 1, p. 422) states that, so far from being a cardiac stimulant, it is a direct depressor of the circulation, because, although it increases the number of the beats, it never increases the force; and in a later and more elaborate article, based upon the results of a direct series of experiments on animals (*ibid.*, 2, p. 39), concludes that it " does not act upon the heart until a considerable point of saturation of the blood and system is reached," and that the heart is then depressed (p. 53). He did not at this time make any experiments directly to decide what the cardiac action of the poison was, except in determination of the local action on the exposed heart of the frog in *toxic* amounts, when he found, after placing a few drops on that organ, that its action speedily became arrested. In a more recent article (*ibid.*, 1871, 2, p. 359) a discussion of the subject is resumed, and he theoretically explains the " excited, violent, and labored action " of the heart in this way: " when the nitrite is taken into the lungs it instantly arrests or diminishes oxidation, and a thrill of impending suffocation runs through the system, in obedience to which the respiratory and circulatory systems gather up and exert to the utmost their forces. The central impulse sent to the cardiac and respiratory muscles is at first much more than sufficient to overcome any direct action of the nitrite upon them, but, the inhalation being persisted in, the impulse is constantly growing weaker, and the direct influence of the drug stronger, so that there soon comes a time when the reverse is true, and the heart's power is more or less nearly extinguished."

Dugau ("Rev. Mens. de Méd. et de Chir.," July, 1880; quoted in "London Med. Record," Aug. 15, 1880, and "Am. Jour. of the Med. Sci.," Oct., 1880, p. 554) concludes, from the result of an elaborate series of experiments, that the nitrite acts upon the heart after all the nerves have been severed; that strong doses cause a diastolic arrest, and that the acceleration of the heart beat seems to be in relation with the fall of arterial tension, *for it occurred after all nervous connection of the heart with the central nervous system was severed.* Brunton ("Med. Times and Gaz.," 1870, i, p. 320) found that the nitrite did not diminish the work done by the heart in a given time, although it decidedly increased the frequency of its contractions. The frequency he is inclined to attribute to a depression of the inhibitory nerves, because it was more apparent in dogs, in which the vagal apparatus is more sensitive than in rabbits ("Jour. of Anat. and Physiol.," v, 1871, p. 92); but he did not make any experiments to specially determine how the pulse was affected, and his deductions, as may be inferred, are based upon theoretical grounds alone. In experiments on the blood pressure he found the same decided diminution as is noted by other observers, but in seven experiments in which the aorta was compressed immediately below the diaphragm the pressure was not reduced as in normal animals, for *a primary rise occurred which equaled about one fifth the normal*, and which preceded a marked fall. Moreover, in three other experiments, in which the spinal cord was cut and the aorta compressed as before, a similar result was recorded. He concludes that the diminution of the arterial tension was vasomotor and not cardiac, but, unfortunately, he does not discuss the cause of the increase in animals with the aorta compressed.

In reviewing the results above recorded, and the deductions made therefrom by the different investigators, we find, indeed, quite a diversity of opinion to deal with. If we first consider the theories of the *modus operandi* of the action on the pulse, much in the papers of Filenhe, Mayer and Friedrich, and Brunton goes to show that the nitrite does depress the vagal apparatus and increase the pulse in this way; yet, evidently, this does not cover the ground, according to Pick's opinion, nor those of Wood and Dugan. Although experimenters almost universally agree that the heart is ultimately slowed and paralyzed, yet, as we see, they do not agree as to how the frequency is affected, and when we come to examine their papers it is found that Filenhe, Mayer and Friedrich, and Dugau were the only ones who made experiments in direct determination of this point, and the deductions of the first three observers must be accepted with allowance because of the very indirect, but no less ingenious, way in which they sought to decide this action. Yet it seems we must admit that the vagi apparatus is depressed, and that the increased action of the heart is at least partially in this way effected. Wood's theory is indeed a beautiful and masterly one, and well worthy of my illustrious friend and teacher, but, unfortunately, it has been founded rather upon hypotheses than direct experimentation. Pick's is logical enough, for it is a truism that there is a compensatory relation existing between the action of the heart and the condition of the vaso-motor system, and that when the vascular channels are open the heart will naturally beat faster in endeavoring to overcome the excessive drainage, and *vice versa.* Dugau's view closely coincides with this, but where he was misled was in not isolating the action on the vaso-motor system from that on the heart, as we shall presently see.

Regarding the action on the arterial pressure, it is almost universally conceded that the marked diminution is both vaso-motor and cardiac, the latter factor coming in late in the poisoning, as is believed by both Wood and Brunton. If this is so, it must be certain that the early fall of pressure is entirely vaso-motor.

If, now, it were possible to eliminate the action of the nitrite on the heart from its action on the vaso-motor system, we could readily determine just how far the acceleration of the heart's beat was affected by this diminution of pressure occurring from vaso-motor dilatation, as well as determine how the amount of work done by the heart is influenced. This identical thing was done, although imperfectly, in Brunton's seven experiments when he pressed the abdominal aorta immediately below the diaphragm, and in the three later ones, in which he compressed the aorta and made section of the spinal cord; for it must be certain that, when the aorta was firmly pressed upon, the action of a large portion of the vaso-motor peripheries was practically paralyzed, because they were unable any longer to affect the arterial tension, and this was even further increased in the animals in which a section of the cord was made, which, of course, practically annihilated the vaso-motor centers in the medulla oblongata. Now, it must be equally as clear that, if we thus have the action of the vaso-motor system practically abolished, and the disturbing influences of the respirations or struggles overcome by curarizing the animals, as was also done, any change in the arterial tension which occurs will be the resultant of a direct cardiac action. What was the result in each of these ten experiments? In every one of them there was a primary and marked rise of pressure, which equaled as much as a fifth of the normal. It, therefore, must be apparent that this curious change in the results must be due to a direct cardiac action and an effect of a direct increase of the heart's power. If we now admit Dugau's evidence that the heart's action is increased after severance of all central nervous communication, it is conclusively proved that the increase of arterial tension is due to a direct stimulation of the heart, increasing both its frequency and the amount of work performed. Why Brunton, Pick, and Dugau did not reach a similar conclusion is, it is obvious, simply because they did not eliminate the vaso-motor from the cardiac action. It is also clear from the foregoing that the acceleration of the pulse must also in part be cardiac.

In a paper on the potassium nitrite, previously referred to, I claimed that the nitrites all affected the economy in a similar manner, and that, although it was found that the potassium salt caused a primary rise of pressure preceding the diminution, which was an entirely different result from that obtained on normal animals with the amyl nitrite, yet briefly it was explained in this way—that the nitrites acted in two ways to affect the blood pressure, the one by directly stimulating the heart, and the second by depressing the vaso-motor system, the centers especially; that the stimulating effects on the heart ultimately gave way to depression; and that the reason why the amyl nitrite did not cause a rise of pressure, like the potassium salt, was because its vaso-motor action was comparatively more intense, and was more than sufficient to overcome the stimulant effect on the heart, which was finally indicated to be a fact by a comparison of the results of Brunton's experiments and my own. It was further clearly demonstrated that the potassium nitrite caused at least a part of the increased frequency of the pulse by a direct stimulation of the heart, and probably by a consentaneous depression of the inhibitory centers.

If, therefore, we accept these deductions as made from the results of Brunton's and Dugau's experiments, it will be obvions that the action of the amyl nitrite is identical with that of the alkaline salts, and, consequently, that it is a direct cardiac stimulant, increasing the frequency of the heart's action and the amount of work done in a given time.

If we now look into the clinical history of this interesting compound, we find that there is no paucity of evidence to support this belief, but, indeed, that cases illustrating it are so numerous that, even without the experimental evidence as above deduced, we could arrive at no other conclusion. For instance: 1, there can be no possible doubt that chloroform is a direct and powerful depressant of the heart, and that in toxic amounts it seriously diminishes the powers of this organ and causes death in a vast majority of cases by this paretic action; 2, that it is a conceded fact that in collapse and syncope the depressed condition of the heart is a marked symptom; 3, that in certain forms of heart disease, whether there be a condition of fatty degeneration, valvular insufficiency without compensating hypertrophy, or simple dilatation, the heart's powers are enfeebled and we have the occurrence from time to time of paroxysms of distress, which are undoubtedly due to a further depression of its working capacity. It is, therefore, evident that in each of the above-mentioned three divisions we have an unmistakable condition of cardiac depression, which, in the last of them, is frequently and decidedly evinced in the paroxysmal attacks which recur from time to time; and it must be apparent that the administration of cardiac depressants in such conditions of the system would be attended with harm, if it did not materially aggravate the symptoms or induce death—for who would think of giving aconite or tartar emetic in cardiac syncope, or when a patient was cold, cyanosed, and gasping for life's breath in a paroxysm of heart pang?* Did the amyl have no further primary effect on the heart than to simply increase its frequency by a depression of the vagi apparatus or by inducing it through a diminution of the arterial tension and without affecting the amount of work done, it would seem certain that in such cases as above quoted either its value as a therapeutic agent would be *nil*, or else it would even aggravate the symptoms, since its only admitted action on the heart, besides the increased frequency, is a depression of its powers and ultimate diminution of its pulsations.

Now, what does the clinical history teach us of the action of the nitrite in chloroform poisoning? Browne ("Med. Gaz.," June 11, 1870) believes that it seems worthy of a trial in chloroform narcosis because its use is followed by a marked acceleration of the heart and flushing of the face. Boder ("Lancet," May, 1875; quoted in "Proc. of the Med. Soc. of the County of Kings," Brooklyn, N. Y., 1875) gives three cases in which dangerous and alarming symptoms of the effects of chloroform were instantly and effectually overcome. Hinton ("Phila. Med. Times," v, 1875, p. 694) cites another illustrating its stimulant effects; and Burrall ("Lancet," May, 1875),

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* An apparent exception to this is the use of hydrocyanic acid, but this is given in such small amounts that only its primary effect on the circulation is obtained, which is a slowing and increased fullness of the pulse, due to a stimulation of the inhibitory nerves, and accompanied by a slight rise in pressure, the depression of the heart and fall of arterial tension being a secondary effect.

Schüller ("Med. Times and Gaz.," Dec. 12, 1874), and Lane ("Brit. Med. Jour.," 1877, i, p. 101) reiterate this statement. The latter observer concludes that when it is inhaled in small quantities it produces recovery from chloroform insensibility, and that this is due to a removal of the cerebral anæmia by the dilatation of the arterioles, to the raising of the temperature of the body, and the removal of the paralysis of the heart. Solger ("Wien. med. Presse," Feb., 1875) furnishes further evidence of the antagonism of the action of the amyl and chloroform; and Dabney ("Richmond and Louisville Med. Jour.," June, 1874) and Smart ("Detroit Rev. of Med.," x, 1875, p. 661), in experiments on animals, further testify to its efficiency. Dabney states that three animals out of four in chloroform insensibility recovered when death was apparently imminent, and that it produced a decided increase of both the force and frequency of the heart. Further, a very interesting experiment of my own, showing the powerful stimulant effects of the nitrites on the heart, is given in a recent paper on the Ethylene Bichloride ("Phila. Med. Times," May 21, 1880), in which the heart was so seriously depressed that the pulsations were imperceptible to the touch, and the pulse-curve tracing was but a mere streak, no oscillations being apparent; yet after giving the amyl the heart's action was recovered with astonishing rapidity.*

Jones ("Practitioner," vii, 1871, p. 213) gives a case of syncope in which the radial pulse was scarcely to be felt, and when the nitrite was given it caused it to beat rapidly and full. From the rapidity with which the patient recovered he concludes that the syncopal condition would have continued longer but for the ether. Minor ("Virginia Med. Monthly," iv, 1878, 1876) used it in a case of locomotor ataxia when the patient was in a condition of impending death, there being a hippocratic expression, stertorous and irregular breathing, complete unconsciousness, an imperceptible cardiac impulse, and cold, clammy extremities. The amyl was given by inhalation, but with no effect, and it was therefore repeated hypodermically, three minims being used; and in a few moments "the heart responded, as evinced by the appearance of a more natural hue of the cutaneous surface. The pulse was recognized in the radial artery. Respiration became better." The temperature was restored, and the patient responded to a pinch, which before was unnoticed. By repeating the dose the pulse became incompressible. As much as fifteen minims was given hypodermically at once.

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* These last references, which properly belong to the physiological papers, are given here because of their bearing such a close relationship to the clinical papers on the same subject.

Another exceedingly interesting case is cited by Madden ("Practitioner," xii, 1874, p. 295) of a woman who suffered with severe and intractable menorrhagia, and who at the time referred to in his article was apparently dead. Upon using the amyl nitrite the respirations and circulation became fairly established and consciousness was subsequently restored. Moreover, whenever she appeared to be falling into this collapsed condition the amyl was resorted to with the happiest results; hence, he thinks that this case "shows in a remarkable manner the power which the nitrite possesses to rouse the heart which has almost ceased to beat."

Two cases of fatty heart serve to further illustrate this stimulant action and the beneficial results, as a consequence, from its use. The first is that of Osgood ("Am. Jour. of the Med. Sci.," 1871, 2, p. 360), who found it to act with remarkable efficacy, and so much so that he believes that death would have ensued in a few moments if it had not been given. The second case is one of Janeway's ("N. Y. Med. Jour.," xx, 1874, p. 58), in which, after the complete extinction of the radial pulse, the nitrite caused it to become full. There are also two cases of valvular disease. Wood ("Am. Jour. of the Med. Sci.," 1871, 2, p. 361) states that in his case the effect of the drug in relieving the pang when other remedies failed was astonishing; and Jones (*loc. cit.*) tells us of a woman who suffered from cardiac dyspnœa, with a dilated hypertrophy of both ventricles (the dilatation being in excess), a feeble circulation, extreme anasarca, pulmonary œdema, lividity of the face, and shortness of breath. The use of the amyl nitrite produced most beneficial effects and induced a pleasant glow all over the body, and on each occasion of its use she felt easier and more comfortable about the chest.

In reviewing all the foregoing facts, I think doubt can no longer exist that the amyl nitrite, like the alkaline salts, acts as a powerful and direct cardiac stimulant, increasing both the frequency of the heart's pulsations and the amount of work done in a given time.

106 Halsey Street, Newark, N. J., June, 1881.

COUP DE FOUET, OR RUPTURE OF THE PLANTARIS MUSCLE.

By A. B. JUDSON, M. D.

This injury is not often described in systematic works on surgery. It is, nevertheless, believed to be not very uncommon. A number of cases were referred to, under the name of rupture of the plantaris muscle, in a discussion which occurred in 1877 on the report of a case by Dr. A. H. Nichols, to the Roxbury Society for Medical Improvement.* The term *coup de fouet* (stroke of a whip) indicates the sudden and acute character of the seizure, without specifying the exact seat of the lesion, which can not, in the majority of cases, be determined.

The following case illustrates the ordinary features of this injury:

The patient was a woman in good health, of middle age, and inclined to *embonpoint.* On November 21, 1878, she was stepping into a street car when she felt something suddenly give way in the right limb, followed by a feeling of warmth and pain in the calf of the right leg. As the pain continued, she took a return car, effecting the transfer with great difficulty, and, after a few steps of extremely painful and difficult locomotion, arrived home. There was an entire absence of objective symptoms. Pain was produced by deep pressure on the inner side of the leg midway between the inner malleolus and the tuberosity of the inner condyle of the femur. Slight motions of the foot were painless, but extreme extension of the foot on the leg was attended by slight pain, while attempts to effect flexion caused intense pain in the calf of the leg. Severe pain also occurred whenever the slightest weight was thrown on the anterior portion of the foot in standing or trying to walk.

These points, together with the peculiar history, recalled to my mind the case reported by Dr. Nichols, and suggested at once rupture of some of the deep muscular or fibrous structures of the posterior portion of the leg. Notwithstanding the apparently trivial nature of the accident, the patient made a very slow recovery, and experienced far more pain and inconvenience than if she had met with a fracture of the bones of the leg. The absence of objective symptoms continued throughout the progress of the case, excepting that there was slight and unimportant œdema of the leg and foot when locomotion was first resumed. The subjective symptoms, on the other hand, were very severe. For the first four or five days there were considerable freedom and ease in movements of the limb in the recumbent position, and a crutch was used. But after that period locomotion in any way was impossible, and the slightest movement of the affected part was attended with severe pain. For five weeks the patient remained recumbent and guarding the limb from motion. Occasional slight attempts at motion gave pain, and were followed sometimes by a night of painful and interrupted sleep. Repeated attempts to prevent muscular action by fixing the joints of the affected limb were made, but they were unsuccessful. It was evident that the methods of fixation which answer in the treatment of a fracture or an arthritis were incompetent to secure that absolute immobility of the parts which alone could preclude muscular action. Hot applications and opiates were used to combat pain and secure sleep. Gradually, and after many painful trials, tolerance of motion was restored and locomotion was performed with greater ease and less and less assistance, until crutches were finally laid aside five months after the receipt of the injury. The patient, however, limped, and the limb remained partially disabled, and subject to attacks of pain after unusual exercise, for more than a year after crutches were discarded. During all this time the patient sought to avoid disturbance or undue action of the muscles of the calf. A high chair was preferred to a low one, so that the anterior portion of the foot could depend, and it was easier to walk with high-heeled shoes. At the present time, two years and a half from the receipt of the injury, the recovery is perfect, and evidently permanent.

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* Boston Med. and Surg. Jour.," Aug. 22, 1878, pp. 247-251.

The following case represents a milder form of this accident:

A lad of nine years, hurrying to dinner, suddenly fell, at the door of the dining-room, on February 6, 1880. He thought he had turned his right foot. He had some pain at the time, and also on the following day, but pursued his occupations as usual. The third day he was found disabled. Motions of the foot were painless, except that extreme extension produced some pain, and flexion of the foot on the leg caused a severe pain extending up the calf. Pressure caused pain in a limited area, and revealed a deep-seated induration in the middle of the calf. He could not rise on the toes of the affected foot, but felt no inconvenience from resting the weight of the body on the heel. There was no discoloration or any objective symptom except the induration above mentioned. Rest and simple applications were practiced. For several days there was constant, but not severe, pain, very much aggravated by slight exertion. Within three weeks from the receipt of the injury he was restored to his companions, but the limb remained weaker than the unaffected one in those exercises in which the sural muscles are violently contracted, as in hopping. In riding on horseback he was unable to throw his weight on the toe of the affected side. At the present time, sixteen months after the injury, the deep induration has disappeared, and the only trace is a feeling of numbness whenever the muscles of the affected part are called into violent action.

The following case exhibited some of the features of this form of injury:

In March, 1879, a young married woman felt something give way in the right leg when walking in an icy place with India-rubber boots that were too large for her. There were some swelling and transient discoloration about the ankle. She suffered considerable pain, could not endure a low-heeled slipper, and had been unable to walk rapidly without limping. At the time of examination, in the following June, there were no objective symptoms, but the occurrence of severe pain in the calf arrested every attempt to push with the anterior portion of the foot either in standing or against the hand applied to the sole of the foot. She was directed to continue the use of high-heeled boots and to persevere in the treatment by rest which she had prescribed for herself. During the summer it was noticed that walking on the beach excited pain because the yielding sand allowed the foot to become unduly flexed on the leg. Eleven months after the receipt of the injury there was still frequent pain in the leg, but in April, 1881, one year later, the patient had entirely recovered.

The literature of this subject is not inconsiderable. Besides the paper and discussion above referred to, the articles of MM. Verneuil * and Servier † may be consulted. The most remarkable

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* "Formes graves du coup de fouet," "Arch. Gén. de Méd.," Jan., Feb., 1877.

† "Dict. Encyclop. des Sciences Méd.," 1st series, vol. 21, article, "Coup de Fouet."

feature of this accident is the insignificant nature, or almost entire absence, of an immediate cause. Persons are attacked while performing the most ordinary locomotive efforts. Men, when quietly walking in the street, have suddenly stopped with the conviction that they had been shot in the leg. Dr. Nichols's patient looked for the stone which he believed had been thrown at him, and, not finding it, thought he had been struck by the hub of a passing vehicle. So firmly was he convinced that the injury was the result of violence, and that his physician was in error, that he relinquished the idea only after an independent diagnosis by Dr. Morrill Wyman. It is quite possible that such a case might have important medico-legal bearings.

The absence of dissections leaves the pathology of this difficulty in some obscurity. The most reasonable view is that which places the lesion in the muscular or fibrous tissues. It is thought that ecchymoses indicate laceration of muscular rather than fibrous structures. But the presence of discoloration would doubtless depend very much on the depth of the affected tissues. Besides ecchymotic discoloration, which is met with in but a limited number of cases, the only objective signs are œdema and deep-seated induration, and these are by no means constant. If there is an obvious gap in the muscles affected, with an adjacent muscular tumor, the case is to be considered one of rupture of the muscles, the term *coup de fouet* being conveniently used to indicate those cases in which the exact lesion remains undetermined.

The diagnosis depends on (1) the suddenness of the attack; (2) the insignificance of the apparent cause; (3) the location of the trouble; (4) the pain, which is absent or slight when the part is at rest, and produced or aggravated by those motions of the limb, active or passive, which disturb the muscles of the calf; and (5) the great disproportion between the objective and subjective symptoms. The same disproportion may hold, as in the first case above related, between the objective symptoms and the duration of the pain and disability.

Recovery is always protracted, and is probably not much facilitated by treatment, which, however, should not be neglected, for the reason that the prognosis is sometimes unfavorable, especially when the affected limb is the seat of deep varicose veins, or shows traces of former phlebitis. Local and general remedies should be directed toward the relief of pain. Repair of the injured structures should be promoted by preventing motion or disturbance of the part affected. The condition which seems best adapted to secure this object is that of enforced fixation with the knee moderately flexed and the ankle moderately extended. As recovery progresses, locomotion will be facilitated by a high-heeled shoe, which prevents the foot from being unduly flexed on the leg. Cases of this injury present opportunities for the exercise of judgment in the decision of the question of abandoning further rest and resorting to motion and exercise.

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Editorials.

AMERICAN INFLUENCE IN GYNÆCOLOGY.

We seem to be coming to a period when America will be accorded credit for something more than the ingenuity in suggestion and the daring in operative procedures that characterized the rise of gynæcology in this country. While we have no reason to regret that those features did stand out prominent, since they attached to the rough pioneer work that of necessity had to be done—there being no stable foundation ready upon which men of various nationalities might vie with each other in the attempt to fashion a finished superstructure, as was the case with almost every other department of medicine—we may none the less rejoice that the era of scaffold-building is passed and gone, and that, standing upon the results of those labors, by the side of men from every quarter, our finer work seems no less creditable than theirs, as shown by the increased closeness with which it is watched.

We are led to these reflections by the perusal of a German edition of Dr. Emmet's "Principles and Practice of Gynæcology," lately issued. Among ourselves, Dr. Emmet has, perhaps, been given more credit for his discovery of the frequency and the pathogenetic importance of lacerations of the cervix uteri and for his practical methods of dealing with them than for anything else. In Europe, however, the importance of the lesion and the philosophy of Dr. Emmet's teachings in regard to it do not seem to be generally appreciated yet—chiefly because, we think, our European brethren have never been properly brought face to face with them, but have rather been puzzled with caricatures of them, resembling them no more than a silhouette resembles a statue. But, now that Dr. Emmet's own words are set before them, at least so far as Germany is concerned, all this ought to be changed. However that may turn out to be, it can scarcely be doubted that his doctrines in regard to chronic non-visceral pelvic inflammations, together with the immense contributions made in this country, by himself and others, to our means of combating those affections, will exert a marked effect upon practice the world over, although, no doubt, that effect may be gradual in its development.

After the meteoric brilliancy of Dr. Sims's earlier achievements, the practical acumen and the comprehensive mental grasp displayed in Dr. Thomas's great work, and the logical straightforwardness of Dr. Emmet's doctrines, together with the mechanical ingenuity that stands out in his writings—after all these have been duly digested abroad, and when, as is now the case, all these men are daily quoted, we may well feel a glow of satisfaction at the influence our countrymen have attained to in gynæcology. The seed planted by Ephraim McDowell, trodden under foot as it was at the outset, has sprung up into a plant which, although slow of growth, now rears a sturdy trunk.

Special Articles.

PURULENT, CROUPOUS OR MEMBRANOUS, AND DIPHTHERITIC CONJUNCTIVITIS IN INFANTS.*

By CHARLES STEDMAN BULL, A. M., M. D.

Ophthalmia Neonatorum, or purulent conjunctivitis of infants, has from early times been recognized as the typical form of suppurative inflammation of the conjunctiva. Owing to the well-known symptoms of the disease, the course which it runs, and the dangers which it entails upon the eye, comparatively little discussion has arisen upon the subject except in regard to two points—the causation of the disease and its prophylaxis. The same can not be said for either membranous or diphtheritic conjunctivitis, though certainly in the latter disease the symptoms are as pronounced and unmistakable as in the purulent form of inflammation. The apparent connection which exists in some cases, clinically, between the purulent and membranous forms of conjunctivitis in new-born children, is much closer and more real than any which is claimed to exist between the membranous and diphtheritic forms of inflammation. Most ophthalmic surgeons occasionally see cases of purulent conjunctivitis in which the discharge at a certain period becomes more coagulable and assumes the form of a membrane; and this process is certainly at first distinct from the conjunctivitis which begins as membranous and subsequently becomes purulent.

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* Galezowski.—"Ann. de Gynéc.," March, 1881.
Abegg.—"Arch. f. Gynäk.," xvii, 3, 1881.
Credé.—*Ibid.*, xvii, 1, 1881.
Olshausen.—"Centralbl. f. Gynäk., Jan. 22, 1881.
Graefe.—Volkmann's "Samml. klin. Vortr.," No. 192.

Purulent Conjunctivitis.—True purulent conjunctivitis begins, probably in the majority of cases, as a catarrhal inflammation, with mucoid or muco-purulent secretion; but the latter rapidly becomes thicker, more cloudy, yellow, and really purulent. Sometimes the change from catarrhal to purulent inflammation is so rapid that the former stage escapes observation, especially if the physician is not on the lookout for ophthalmia. The disease, according to nearly all authorities, begins on the second or third day after birth, though it may appear on the first day, or may be postponed to the fifth. If it does not appear until after the fifth day, the suspicion is aroused that the contagion has occurred since birth, and from some other cause than inoculation with the vaginal discharge of the mother during parturition.

The symptoms of a well-marked case are easily enumerated: Swelling of the tissue of the eyelids; redness of the cutaneous surface, sometimes amounting to lividness; more or less sticking of the lid-margins together; the appearance of a purulent discharge when the lids are opened; marked injection of the ocular conjunctiva, accompanied generally by some chemosis; sometimes the lids are so swollen as to prevent their eversion, but, where they can be turned out, the retro-tarsal fold is found enormously swollen, as is also the papillary portion of the tarsal conjunctiva, and covered by a yellow exudation, which may be more or less flocculent or even stringy. There is great heat of skin in the immediate vicinity, and sometimes a slight rise in the general temperature. This condition lasts a varying length of time, usually from four to six days, and then the acute inflammatory symptoms begin to subside, though the purulent discharge may be very profuse for a much longer period. Both eyes are almost always affected, though usually one before the other.

Though in the great majority of cases the disease runs the course just depicted, yet there are exceptions. In some instances the ropy, fibrinous exudation which is noticed in the beginning continues to the end, and is accompanied by patches of coagulation upon the conjunctiva itself, which may, leave white spots behind them, though this is very exceptional. In other not very rare, cases, the flocculent, fibrinous material is deposited continuously over the whole tarsal surface of the conjunctiva, and resembles a membrane very closely. It is, however, friable, and, though easily removed by the forceps, comes away in small bits or shreds, and rarely in one continuous piece. It always leaves a raw, bleeding surface, and the hæmorrhage is sometimes quite profuse. This may not form again, though it usually does. With this pseudo-membranous formation there is also an abundant purulent discharge, which lasts long after the pseudo-membrane has ceased to be formed. These cases resemble closely the cases described by some of the German authors as croupous conjunctivitis, though it is proper to state that the membrane in the latter is usually coextensive with the palpebral conjunctiva, and moderately thick. They seem to be cases of the disease in which the products of inflammation are of a more highly organized type.

Purulent conjunctivitis of infants, though comparatively rare in the higher classes, is of very frequent occurrence among the lower orders, and is especially rife in hospitals for the confinement of women. Credé's statistics cover a period of seven years—from 1874 to 1880, inclusive; there were, in this period, 2,466 births and 227 cases of purulent ophthalmia, but the percentage varied somewhat from year to year, and during the last year became very small. In 1874 there were 323 births and 45 cases of conjunctivitis, or 13·6 per cent. In 1875 there were 287 births and 37 cases, or 12·9 per cent. In 1876 there were 367 births and 29 cases, or 9·1 per cent. In 1877 there were 360 births and 30 cases, or 8·3 per cent. In 1878 there were 353 births and 35 cases, or 9·8 per cent. In 1879 there were 389 births and 36 cases, or 9·2 per cent. In 1880, up to May 31st, there were 187 births and 14 cases, or 7·6 per cent., but for the remainder of the year there were 200 births and 1 case, or only 0·5 per cent. The reason for this marked falling off in the number of cases will be stated farther on. Olshausen's percentage of cases is larger than Credé's later percentage, for out of 550 births there were 69 cases of purulent conjunctivitis, or more than 12·5 per cent. Galezowski, since 1870, has observed 507 cases of purulent ophthalmia out of a total of 60,152 cases of disease of the eyes, and among these there were 111 cases of serious results, ending either in permanent diminution or total loss of vision.

As regards the causation of the disease, there seems to be but one opinion among recent writers, whether from the ophthalmological or from the obstetrical standpoint, viz.: that the ophthalmia of new-born children is in the great majority of cases due to inoculation during parturition with the muco-purulent or purulent discharge from the vagina of the mother. The appearance of the disease so soon after birth and the almost constant occurrence of a vaginal discharge in the mothers both point in this direction. The latter, however, can not be regarded as the only cause, for cases now and then occur of purulent conjunctivitis where the mothers have had no discharge from the vagina. This vaginal secretion need not be purulent, for an ordinary vaginal catarrh or the lochial discharge has been known to cause many cases of purulent conjunctivitis in infants.

The disease may be, and often is, communicated by carelessness and uncleanliness on the part of nurses, mothers, and other attendants, often in the washing of the children after birth or in handling them subsequently, by carrying the vaginal discharge upon the fingers or upon the bedding or clothing. The danger from this carelessness and uncleanliness on the part of attendants helps to explain the frequent epidemic appearance of ophthalmia neonatorum in lying-in hospitals and foundling asylums, though another important factor in the causation of these epidemics is the influence of the badly-ventilated rooms and wards in these buildings, where, perhaps, similar epidemics have previously occurred, thus poisoning air, walls, and floors, as well as the contents of these rooms and wards. Still, cases do occur in which no contagion can be traced, and here it has been customary to refer the outbreak of the disease to a sudden draught of air, maintenance in an impure atmosphere, or sudden exposure to very bright light; which influences, acting upon an already existing catarrhal conjunctivitis, may change the latter to a purulent form of conjunctivitis.

Credé, who writes of the disease from the obstetrician's standpoint, states that in his experience the cases of ophthalmia in new-born children have been, almost without an exception, caused by direct contact of the vaginal secretion with the eyes during parturition. In his opinion, the infectious character of a vaginal secretion continues long after the specific gonorrhœal symptoms have disappeared. Even in cases where almost no secretion from the vagina of the mother exists, purulent ophthalmia in the child has still been known to follow within the first few days after birth. Galezowski, who writes from the ophthalmic surgeon's standpoint, says that it is always caused by the introduction of the leucorrhœal or gonorrhœal vaginal secretion between the eyelids of the infant during parturition, and Abegg agrees with him.

Recognizing this fact in the etiology of the purulent conjunctivitis of infants, our main endeavors should be directed toward preventing the occurrence of the disease. The practical question is one of prophylaxis, and to this end the care of the disease must be placed in the hands of the obstetrician and those of the nurse, and on them must rest the responsibility of the result. When it is considered how many cases of permanent disability from blindness, which fill our blind asylums, are due to this cause, it will readily be seen how grave is this responsibility, and how very necessary it is, not only that the disease should be properly treated, but that the treatment should be prophylactic. As a precautionary measure, the vagina of the mother should be kept thoroughly cleansed for some days before confinement, though the uncertainty of the occurrence of the latter renders the duration of the former equally uncertain.

Credé employed this method of cleansing and disinfecting the vagina, but the effects upon the occurrence of ophthalmia were trifling and unsatisfactory: the cases of conjunctivitis diminished, but did not disappear. He then began to disinfect the babies' eyes, and the result was at once surprisingly favorable. In all cases of vaginal gonorrhœa and catarrh in the institution under his care frequent disinfection was practiced with weak carbolic- and salicylic-acid solutions (2 : 100). The first trials on the babies' eyes were made with a 1 : 60 solution of boracic acid. This not proving satisfactory, he began to use a 1 : 40 solution of nitrate of silver, injected between the eyelids shortly after birth, first washing the eyes with the weak salicylic-acid solution. All the eyes thus treated remained well. During the year ending June, 1881, the treatment was as follows: The unclosed lids were first carefully cleansed with fresh water; then a few drops of a 1 : 50 solution of nitrate of silver were dropped into the gently-opened lids; then for twenty-four hours applications of the salicylic-acid solution (2 : 100) were made to the eyelids. All these babies remained free from the disease.

Olshausen first used as a prophylactic a one-per-cent. solution of carbolic acid as a wash for the eyes; this reduced the percentage of cases of ophthalmia from 12·5 to 6 per cent. in two years. Immediately after the birth of the child, even before the breech is born, the still closed lids of the infant are to be washed with this carbolic-acid solution, and then the eyes are cleansed with the same solution. As a result of this treatment, among 166 children born in 1880, only 6 cases of purulent ophthalmia appeared, or 3·6 per cent.; and these cases were very mild, and some of them were limited to one eye. He does not employ either the nitrate-of-silver solution or the continuous bathing with the salicylic-acid solution, as the latter demands constant attention.

In the lying-in department of the Dantzig hospital, under the charge of Dr. H. Abegg, since the precaution has been taken of carefully washing the lids and conjunctival sac immediately after birth, the results have been very satisfactory. Out of a total of 2,266 births during the ten years between 1871–80, only 66 cases of ophthalmia occurred, or 3 per cent.

The prophylactic measures recommended by the writer are as follows: In all cases of vaginal discharge in parturient women, whether specific or not, the vagina should be carefully cleansed and disinfected repeatedly before parturition begins. As soon as the child is born the external surface and edges of the eyelids should be carefully cleansed with a one- or two-per-cent. solution of carbolic acid, and then the conjunctival cul-de-sac washed out with some of the same solution, or with a saturated solution of boracic acid. This must be done by the attending physician, or by a skilled nurse under his supervision. The eyes of all new-born children should be carefully watched for the first week or ten days, and, whenever any signs of an ordinary catarrhal conjunctivitis appear, the conjunctiva should be thoroughly brushed over with a solution of nitrate of silver, from 2 to 5 grains to the ounce of water.

If the conjunctivitis has become purulent, and the case is one of real ophthalmia neonatorum, the child should, if possible, be isolated from all healthy infants, and have its own bath-tub. If this is not possible, the diseased infant should be bathed *last*, and no sponges should be used, but only cloths, which can afterward be destroyed. If one eye only is affected, do not apply the hermetically-sealed bandage to the sound eye, but envelope the arms or hands of the baby, so as to prevent the secretion from being carried to the fellow-eye, and lay the child upon the side corresponding to the diseased eye.

The most important feature in the treatment is enforced cleanliness. This requires constant attention and the frequent use of some soft cloths and plenty of water. The use of cold cloths, dipped in cold water or even iced water, and laid on the eyelids, must be regulated by the amount of swelling of the lids and heat of the parts. As soon as the lids can be everted, the proper treatment is a thorough application of nitrate of silver to the conjunctiva of the lid and retrotarsal fold, daily, and sometimes twice a day. If this is thoroughly done, a five-grain solution will in most cases suffice; but, where there are profuse secretion and considerable swelling of the conjunctiva, a ten-grain solution becomes necessary. When, owing to marked hypertrophy of the papillary structure of the conjunctiva, a stronger caustic becomes necessary, it is better to discard solutions, and employ the lapis mitigatus (one part nitrate of silver to two parts nitrate of potassium), and neutralize its effect by a subsequent washing with a solution of common salt.

It is well to employ a one-grain solution of sulphate of atropia in a saturated solution of boracic acid in every case of purulent ophthalmia, as the great danger in this disease is purulent infiltration and perforation of the cornea. Should this infiltration occur at the center of the cornea, the atropia should be instilled frequently, for, if perforation occurs, the dilatation of the pupil will prevent a large prolapse of the iris through the perforation. If the infiltration of the cornea, on the contrary, be at or near the margin, it is better to employ a two-grain solution of the sulphate of eserine, as thus an extensive prolapse of the iris may be prevented if the ulcer perforate. In all cases the cleansing and washing of the lids and conjunctiva should be done with a saturated solution of boracic acid, and the atropine and eserine should be dissolved in the same.

Membranous Conjunctivitis.—Though most German authorities, and some others, regard croupous or membranous conjunctivitis as a distinct disease, differentiating it both from purulent and from diphtheritic conjunctivitis, yet the writer regards this as extremely doubtful, at least so far as the purulent form of inflammation is concerned. Saemisch defines croupous conjunctivitis as that variety of inflammation which is characterized by the formation of a more or less extensive membrane *upon* the surface of the conjunctiva of the lids. The intensity of the inflammatory process varies in different cases: in some the membrane is a very thin, perfectly transparent, thread-like gelatinous layer, while in others it is denser, thicker, opaque, and yellowish-white in color; and this may sometimes be removed in one entire membrane from the *surface* of the conjunctiva. When the membrane is of the latter character, it adheres with tolerable firmness to the conjunctiva, and can not be easily wiped off, but must be removed with the forceps, and always leaves a bleeding surface beneath it. The gelatinous layer of exudation, on the other hand, is easily removed with a small brush or bit of muslin, and, if this is done carefully, does not leave a bleeding surface beneath it. The lids are reddened and swollen as in the purulent form of the disease, and there is, moreover, a more or less abundant flocculent secretion, which may be purulent from the beginning. Saemisch says that the disease subsequently runs into the catarrhal or purulent form of inflammation, but it is certain that in the large majority of cases the flocculent, more or less purulent secretion is present from the beginning.

From the further statement of Saemisch, that in a small number of cases the croupous form merges into the diphtheritic, the writer ventures to decidedly dissent, holding that the croupous and diphtheritic forms of conjunctivitis are two distinct diseases, differing in their pathology and pathogenesis. The pathological process in the croupous form of conjunctivitis consists mainly in the deposit of an albuminous exudation, probably fibrine, *upon the surface* of the inflamed conjunctiva, which deposit rapidly coagulates on exposure to the air, and thus assumes the form of a membrane. This deposit contains cells which have made their exit from the mucous membrane, and upon the number of these cells depends more or less the firmness and density of this membrane, as may be shown by a microscopic examination. When this membrane is removed, either as a slough by the processes of nature, or by the forceps in the hand of the surgeon, the mucous membrane lies bare, deprived of its epithelium throughout a varying extent; but there is *no loss of substance* of the conjunctiva, and but *very little infiltration* of its tissue; and here is the point at which croupous inflammation differs from diptheritic inflammation, as will be shown farther on.

When the membrane has been removed, it may form again, or the exudation may assume the purulent form, and then we have a purulent ophthalmia to deal with, and the epithelial layer is reformed. The writer is strongly inclined to believe, though still with some hesitation, that these cases of conjunctivitis in which the formation of a pseudo-membrane is the characteristic feature are cases in which the conjunctival inflammation is of the same nature as the purulent form, but in which the exudation is for a time of a higher organization. Even those authors who insist most strenuously that membranous conjunctivitis should be regarded as a distinct disease, admit that in very many cases of purulent conjunctivitis the exudation at first coagulates very rapidly on exposure to the air, and thus forms a pseudo-membrane over the surface of the conjunctiva. The tendency to this coagulation of the exudation is very often seen in cases of catarrhal conjunctivitis, though a continuous pseudo-membrane, covering the entire surface, is never formed in these cases.

The writer has recently had an opportunity of noting the occasional marked tendency to the formation of a pseudo-membrane in purulent conjunctivitis. During the months of January, February, and March of this year there occurred quite a number of cases of purulent ophthalmia in infants at the Nursery and Child's Hospital in this city. Out of a total of 27 cases of purulent conjunctivitis the tendency to the formation of this pseudo-membrane was noted in 13, and in several of these the membrane covered the entire palpebral conjunctiva. In only two cases was the membrane of any degree of thickness, but these two required the forceps for its removal. In no other respect did they differ from the ordinary type of purulent conjunctivitis. Several of these pseudo-membranous formations were examined microscopically by the writer. Running in every direction through the tissue were delicate fibrillæ of connective tissue, which in some places were collected together into larger fibrillæ. There were large numbers of round cells, so-called exudation corpuscles, and a large amount of fine, amorphous, granular matter. The meshes were generally small and close, though in places they were quite loose. In some places the fibrillæ were so close together as to appear to form laminæ, and these apparent laminæ were arranged in arcs of concentric circles, though they never formed complete circles. The fibrillæ were more numerous on the external surface of the pseudo-membrane, showing there a higher grade of organization.

The treatment of these cases of membranous formation does not differ from that of the ordinary form of purulent conjunctivitis. It must be strictly antiphlogistic and disinfectant, by the application of cold cloths and the use of a saturated solution of boracic acid or of a one-per-cent. solution of carbolic acid for cleansing purposes. As fast as the discharge appears it must be removed, either with a small brush or with a piece of soft muslin. If the pseudo-membrane be of the thin, gelatinous variety, it may easily be removed; but, if it be dense and firm, no attempt at removal should be made, as it is better to wait until it is cast off as a slough. During the early stage no caustics should be employed, but, when the purulent secretion has become established, the same remedies are indicated as in the purulent form of the disease. The indications for the use of atropine or eserine are the same as before mentioned. Attempts have been made to cut short the tendency to the pseudo-membranous formation by the insufflation of powdered quinine sulphate, but hitherto without much effect, and the application is often quite painful.

Diphtheritic Conjunctivitis.—The rarest form of conjunctival inflammation, as it is the most dangerous to the eye in its destructive tendencies, is the diphtheritic. This disease, though not uncommon in Berlin and some portions of northeastern Germany, is relatively rare in other parts of the Continent of Europe, and absolutely rare in Great Britain and the United States. During a period of ten years' connection with the New York Eye Infirmary, and also with several other public hospitals, and an observation of more than twenty thousand cases of eye disease, the writer has seen but ten cases of true, unmistakable diphtheritic conjunctivitis, as seen at the Berlin clinics. This is a fortunate exemption from the disastrous consequences of a rapidly destructive disease.

Diphtheritic conjunctivitis is characterized by a very marked swelling of the lids, due to a more or less *extensive infiltration*, not only of the *entire conjunctiva* but also of the *other tissues of the lid*, sometimes even including the *integument*, by an inflammatory product of marked coagulability. This infiltration is *into the tissue* of the conjunctiva, and not an exudation *upon its surface.* The local heat of the parts is very pronounced. The infiltration into the lids is so great that they become almost like a board, look and feel like brawn, and can not be everted. This dense infiltration often drives all the blood out of the eyelids, and, instead of presenting a livid appearance, as in the purulent form of conjunctivitis, they appear dusky yellow, and even blanched. As a consequence of this extensive and rapidly occurring infiltration, the nutrition of the parts is interfered with or entirely cut off, and the conjunctiva changed into a necrotic mass and cast off as a slough. This necrosis sometimes extends deeper than the conjunctiva, and an extensive loss of substance in the lid tissues occurs. When the strangulation is not so extensive in the lid, and the skin looks angry and reddened, the dense, hard, brawn-like condition of the lids is sufficient to distinguish the case as one of diphtheritic conjunctivitis. Such a case can not be mistaken for purulent ophthalmia. When it is possible to evert the lid in part, the inner surface is seen to be of a gray or grayish-yellow color, usually bloodless, which appearance is due to an infiltration of the entire thickness of the conjunctiva, and not to the formation of a membrane upon its epithelial surface.

During this first stage of the disease the exudation from the conjunctiva is usually slight, and consists of a thin, dirty, very hot, ichorous fluid, containing yellowish shreds and some cells. This exudation in the second stage changes in character, and becomes puriform and finally purulent. The disease is rapid in its progress, and reaches its height usually within a few days. The ocular conjunctiva becomes densely infiltrated, and surrounds the cornea like a hard, unyielding wall. There are usually but few blood-vessels to be seen, but numerous punctate hæmorrhages are not infrequent. After the disease has lasted from five to eight days, the hard, board-like condition of the lids diminishes, small sloughs begin to appear in the conjunctiva, the latter becomes loose, red, and bleeding, and assumes the appearance of a suppurating or granulating surface. The ocular conjunctiva takes on the same change; the lids can be everted, the secretion becomes purulent, and the second stage has begun. This stage lasts a varying time, differing in no respect from an ordinary purulent ophthalmia, and terminates in the third or cicatricial stage. This latter is the deeper and more extensive, the greater was the destruction by necrosis following the infiltration.

This description of the disease in its various stages we owe originally to von Graefe, who first differentiated it as a distinct affection. Any one who has once seen such a case can not fail to make a diagnosis in subsequent cases. Usually the general condition of the patient affected with diphtheritic conjunctivitis is bad. The eye may be the only organ affected by the disease, though often the nose, the throat, and the ears are all involved in the process. The local manifestation of the diphtheritic poison may appear first in the conjunctiva, or it may spread from the nose or throat to the eye. In North Germany diphtheritic conjunctivitis is a not infrequent complication of malignant scarlatina. It occurs more often in children than in adults, thus resembling the croupous form of inflammation. The diphtheritic process in the conjunctiva is probably caused by the presence of lower organisms, and the chief part in the infiltration is taken by cellular elements, which are so numerous and so densely packed together as to obliterate the vessels and cut off the circulation.

From this rapid survey of the symptoms and course of a diphtheritic conjunctivitis, it will be seen that there are always necrosis of tissue, loss of substance, and cicatrization in the lid, none of which evils occur in the purulent or membranous forms of conjunctivitis. In all three stages of the disease, as in purulent and membranous ophthalmia, the great danger is ulceration and necrosis of the cornea; and the more the ocular conjunctiva is involved the greater is the danger. The nutrition of the cornea may be so rapidly interfered with that it may become entirely opaque within forty-eight hours; and when this occurs it sloughs out almost always entire, like a watch-crystal from its frame. Where the cornea is not entirely surrounded by the brawny conjunctiva, part of it can generally be saved, even in its transparency, though this is rare.

The prognosis in a case of diphtheritic conjunctivitis is almost always bad, owing to the very rapid strangulation of the tissues. Not uncommonly the lower lid becomes excoriated upon its skin surface by the acridity of the discharge in the first stage, and becomes covered by a diphtheritic membrane. Fortunately, the disease is rare among new-born children; it occurs more frequently, according to German authorities, between the ages of two and seven. In this country and in Great Britain the disease appears only sporadically, but in Berlin and East Prussia epidemics have been known to occur on several occasions. It is extremely contagious, and this is now the explanation of the occurrence of epidemics, the disease being propagated by infection with the secretion.

One point in the pathology of the disease has given rise to an almost endless discussion, which in some quarters has not yet been satisfactorily settled, viz., whether the disease is ever produced by infection with the purulent secretion from a non-diphtheritic case. The establishment of this fact would militate strongly against the doctrine that diphtheritic conjunctivitis is a distinct disease. Yet there seems no good reason for doubting that diphtheritic conjunctivitis has been produced by infection with the purulent secretion of a gonorrhœal conjunctivitis, for it was frequently seen at von Graefe's clinic in Berlin and elsewhere. Yet von Graefe himself defined it as a general constitutional disease, and clearly differentiated it from purulent conjunctivitis. In view of the authenticity of the cases above referred to, we must agree with the modified statement of von Graefe that, while in many cases diphtheritic conjunctivitis is a symptom of a general disease, yet there are cases in which it is a local disorder, caused by infection with the secretion from a purulent ophthalmia. The reverse of the case has also been stated to be true, on the authority of Horner, who states that, though the discharge from a case of diphtheritic conjunctivitis, when applied to a healthy conjunctiva, usually reproduces diphtheritic conjunctivitis, it does not always do so; for purulent conjunctivitis has been known to result from such infection. This would seem as if purulent and diphtheritic conjunctivitis were intimately connected, and leaves the pathogenesis of the latter still in an unsettled state.

The disease is not always binocular, and great care must therefore be taken of the unaffected eye. If the case be seen early enough, some impermeable or hermetically-sealed bandage should be applied, the best being that of Dr. Buller, of Montreal, through the glass center of which the eye may be constantly watched. Yet this is not always a protection, for, when there is a constitutional blood disorder at the bottom of the disease, of course no external protecting bandage would be of any avail. The treatment must be in the beginning decidedly antiphlogistic. Iced compresses must be constantly applied and continually changed throughout the first or diphtheritic stage. Local bleeding by means of leeches to the temple may prove necessary, but there is some danger of a diphtheritic membrane forming upon the bites. Scarifications of the ocular conjunctiva do no good, and should not be undertaken. *No caustics should ever be employed in the first stage, as they would do positive harm.* If the cornea become involved early in the disease, there is almost no hope of saving it, for the cold applications aid in its necrosis, while it would scarcely be safe to use warm applications to the lids. As soon, however, as the violent signs of inflammation diminish, it is better to employ moist warmth in order to facilitate the slough of the necrosed conjunctival tissue. When the second or purulent stage has fairly begun, then the application of caustics is indicated under the same rules as apply to true purulent conjunctivitis. The same rules also apply to the use of atropine or eserine in the diphtheritic form as in the purulent form. As soon as the stage of cicatrization has begun, it is better to stop the use of caustics, as they do no good, and may do harm. Cleanliness in all three stages is very important, and the best means thereto is a one-per-cent. solution of carbolic acid, applied with a brush or gently injected under the lids.

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Reviews and Literary Notes.

Lehrbuch der hygienischen Untersuchungsmethoden. Eine Anleitung zur Anstellung hygienischer Untersuchungen und zur Begutachtung hygienischer Fragen für Aerzte und Chemiker, Sanitäts- und Verwaltungsbeamte, sowie Studirende. Von Dr. Med. C. Flügge, Privatdocent an der Universität Berlin. Mit 88 Abbildungen im Text, 17 Tabellen, und 4 lithographirten Tafeln. Leipzig: Veit & Co., 1881. Pp. xviii–602.

To attempt to review a work which is itself a review of almost the entire range of sanitary literature would require a space as great as that of the book before us, which gives, in phrase as concise as is compatible with perspicuity, descriptions of the different processes employed in every department of hygienic inquiry, with critical comparisons of their relative merits, and impartial considerations of the etiological significance of the various conditions ascertained by them. Of the importance of such a treatise no one need be told who knows how much of sciolism has been grafted upon the slender stock of science in connection with preventive medicine; how many theories of pathogenesis are founded upon pet processes of one-sided examination; and how prone is the ordinary mind to confound occasional coincidences with causal relations.

The main divisions of the work are under the usual headings of Air; Soil; Water; Food; Ferments, Microzymes, and Disinfectants; Special Surroundings of Man, comprising Clothing, Habitation, Ventilation, Heating, Illumination, Disposal of Refuse, Occupation; Epidemiology; and Statistics. The methods of examination are ranged in sequence as physical, chemical, and microscopical, wherever these are applicable. In the first section, after an exhaustive summary of ordinary meteorological processes and results, we find an interesting chapter on ozonometry, a subject which has lately been agitating the mind of a special committee of the American Medical Association, and than which none in the whole range of hygiene has been involved in greater uncertainty. The primary difficulty, as every sanitarian knows, is to differentiate the reactions of ozone from those of hydrogen peroxide (Schönbein's so-called antozone), nitrous or chlorinated compounds, bromine, etc. For this purpose numerous differential tests are given. For example:

OZONE	PEROXIDE OF HYDROGEN
Converts suboxide of manganese (mangan-oxydulsalz) into peroxide; bronzes paper prepared with sulphate of manganese.	Decolorizes solution of permanganate; bleaches sulphate-of-manganese paper which was bronzed by ozone.
Changes ferrocyanide of potassium to ferridcyanide.	Reduces ferridcyanide of potassium to ferrocyanide.
Bronzes thallium paper.	Bleaches thallium paper bronzed by ozone.
Decolorizes indigo solution; strikes a blue tint immediately with tincture of guaiacum.	Decolorizes indigo solution only after the addition of sulphate of iron; gives a blue tint with guaiacum only in the presence of blood or extract of malt.

Sulphate of manganese serves to distinguish free bromine or chlorine from ozone, which alone produces the brown coloration. Manganese or thallium paper remains unaffected by nitrous compounds, while litmus paper may determine the absence of free nitrous acid. Peroxide of hydrogen is discriminated from these other oxidizing substances by the last-mentioned of the above-tabulated differential tests. Mere qualitative ozonometry, therefore, is by no means so simple an affair as beginners in hygiene are apt to imagine; and when we come to quantitative estimation the problem is infinitely more complicated. Most of the sources of fallacy in the ordinary colorimetric methods with iodized-starch paper are well known to meteorological observers; but, aside from the confusing effects of other agents than ozone in the atmosphere, a varying proportion of the iodine is volatilized under different conditions of moisture, temperature, and movement of the air, and other circumstances not yet understood. This volatilization is still more marked in the case of Fox's potassic-iodide paper, which, moreover, is equally affected by peroxide of hydrogen and nitrous acid. Houzeau's modification, by the use of reddened litmus paper with potassium iodide, serves to eliminate free nitrous acid, but has little or no quantitative value. The thallium paper, more recently introduced, seems to be preferable in most respects, but is open to the objection that it readily attracts carbonic acid and is thereby rendered less sensitive to ozone. Even if an accurate ozonoscopic test paper could be devised, however, the author justly observes that no quantitative analysis could be of any scientific importance which did not measure the quantity of air examined, and insure that all of its contained ozone was brought in contact with the reagent. To hang a strip of test paper in the open air to measure the quantity of ozone is about as rational as to set a saucerful of calcium chloride out of doors to determine the amount of water in the atmosphere. To secure greater exactness in this particular, several volumetric or titrating processes have been suggested, the most elaborate of which is in use at the observatory of Montsouris, estimating the amount of ozone in a given volume of aspirated air by the conversion of arsenious acid into arsenic acid, and requiring standard solutions of arsenite and iodide of potassium, carbonate of ammonium, starch, and iodine.

Despite the complicated and delicate manipulations of this method, however, it neither excludes other oxidizing constituents of the atmosphere, nor assures complete combination of all the ozone which may be present. This latter objection would hold good even if nitrogenous substances were separated by filtration through potash, and peroxide of hydrogen calculated by Schöne's or Houzeau's methods.

In the absence of any satisfactory ozonometric system, it is manifest that no discussion of the hygienic importance of ozone can rise above the level of what our author calls "groundless speculation." Most of the observations hitherto recorded have, of course, estimated rudely and qualitatively the aggregate of several oxidizing agents (to say nothing of Schöne's recent assertion that the tests employed have been hygrometric rather than ozonometric); and, even under this generalization, no uniform connection has been noted between disturbances of public health and variations of so-called atmospheric ozone, minima having been noted both during the prevalence of epidemics and in seasons of almost entire immunity from them, while, on the other hand, maxima have coincided with the most violent epidemics. The only practical result of numerous records, extending over more than twenty years, is that an apparent increase of ozone concurs with high winds and with frequent rains.

The differential determination of nitrous and nitric acids and their compounds, and of other gaseous admixtures, is further considered under the head of chemical analysis of the atmosphere, which is followed by a succinct account of microscopical methods of examination.

With the same thoroughness all of the numerous methods of water analysis are passed in review, the many disturbing reactions which may vitiate their results are pointed out, and their respective inevitable shortcomings are explained. On the score of general accuracy in the detection of organic matter, Frankland's process has the author's preference, though the methods of Wanklyn and Chapman and Kübel have the recommendation of greater simplicity. It is, however, insisted that neither these nor any other procedures yet invented can afford a quantitative determination of the noxious properties of drinking water. Neither the amount of those organic substances which may favor fermentation and the consequent development of morbific germs, nor that of the products of fermentation and putrefaction, can be ascertained with any approach to accuracy; the admixture of sewage is only roughly represented by the proportion of chloride of sodium present, and this may depend upon other varying conditions. In view of such uncertainty regarding the specific qualities and relative quantities of different contaminations, or of the sources from which they respectively arise, it is illogical to attempt to establish a limit of impurity above which water shall be pronounced dangerous to health, below which its use may be sanctioned. Observation has shown that drinking water loaded with putrescent matter does not necessarily induce disease; and, on the other hand, it is possible that evanescent organic matters in quantities too minute to afford definite reactions may furnish pabulum for the multiplication of infective microzymes.

The microscopic detection of schizomycetes is scarcely in itself of greater hygienic value, since, in the first place, the significance of such organisms depends on the acceptance of hypotheses not yet fully demonstrated, and, furthermore, it is almost impossible to make sure that they have not, in any given instance, been introduced during the transit of the specimen from its original source to the microscope stage. No quantitative estimate can by this means be formed of bacterial contamination, nor does our present knowledge of the specific properties of different micro-organisms warrant any conclusions which are not based upon physiological experiment.

We have selected these two subjects for insufficient comment, in order to convey to the reader some idea of the character of a work one of the greatest merits of which is its clear exposition of the narrow limits of our present information and the imperfections of our present means of research. Let it not be supposed, however, that the author is a pessimist who denies all value to hygienic investigations; on the contrary, while pointing out the inaccuracies and sources of error in separate processes, he indicates the best available schemes for combining these to achieve more practical results, and teaches how far deductions are warrantable from their conjoint operation. All the chapters manifest equal masterly ability and extended research, and the treatise as a whole must, wherever it becomes known, be accepted as an indispensable addition to the library of every one interested in sanitary science.

A Practical Treatise on Diseases of the Skin. By Louis A. Duhring, M. D., Professor of Diseases of the Skin in the Hospital of the University of Pennsylvania, etc. Second edition, revised and enlarged. Philadelphia: J. B. Lippincott & Co., 1881. Pp. 644.

Dermatology has been ardently studied in this country during the past ten or twelve years, and those who have given themselves to this work have aided materially in the progress of that department of medicine. Still, their number is small, and hence the rapidity with which the first edition of Dr. Duhring's book was exhausted must be imputed to a praiseworthy desire on the part of the profession in general to add to their knowledge of skin diseases. Not only may we infer from this widespread interest in the subject that cutaneous affections are now more clearly understood and more effectively treated by general practitioners than they were a few years ago, but we may also conclude that the miniature which dermatology presents of general pathology has done a good work in diffusing a sounder knowledge of medicine as a whole. We think that Dr. Duhring may fairly be credited with having promoted this good work by freeing the subject to a considerable degree of the apparent intricacies that hedged it about in the minds of those who were not familiar with its special literature. Therefore, while we do not consider that his treatise is of surpassing value to professed dermatologists, we regard it as an excellent one for the great mass of the profession.

The second edition is somewhat larger than the first, containing new sections on Uridrosis, Phosphorescent Sweat, Urticaria Pigmentosa, Dermatitis Circumscripta Herpetiformis, Impetigo Herpetiformis, Pityriasis Maculata et Circinata, Dermatitis Exfoliativa, Dermatitis Gangrænosa, Dermatitis Medicamentosa, Dermatitis Papillaris Capillitii, Fungoid Neoplasmata, Tuberculosis Cutis, Podelcoma, Ainhum, Perforating Ulcer of the Foot, and Myoma Cutis. Without speaking in detail of all this added matter, we will simply mention a few points that have attracted our attention.

The author's dermatitis circumscripta herpetiformis is the chronic herpes of Neumann. He states that he has met with cases of the impetigo herpetiformis of Hebra "representing other phases of the disease than heretofore described." In some cases the lesions were vesicular and bullous; in others pustular; in still others, and the majority, bullous and pustular combined, or appearing alternately. In all instances there was more or less tendency for the lesions to become grouped or to extend about the periphery. Constitutional disturbance was always present, varying in degree, together with violent itching. There was a disposition to repeated attacks during a number of years, the disease being but little influenced by treatment. None of the cases occurred in pregnant women, nor did any prove fatal. Contrary to the experience of Horand, Dr. Duhring has met with pityriasis maculata et circinata chiefly in adults. He considers it "more than probable" that there is a pathological relationship between certain cases of localized so-called dermatitis exfoliativa and some cases of cheiro-pompholix that have been reported.

He regards medicinal eruptions as comparatively rare. The "commoner drugs" referred to as occasionally producing them are: arsenic, belladonna and atropine, bromine and the bromides, cannabis indica, chloral, copaiba, cubebs, digitalis, iodine and the iodides, mercury, opium and morphine, phosphoric acid, quinine, salicylic acid, santonine, stramonium, strychnine, and turpentine. The author's experience is in accord with Hebra's, that diseased conditions of the general cutaneous surface are never excited by the internal administration of any of the mercurials.

He thinks it questionable if Madura foot is due to a fungus. In regard to the "inflammatory fungoid neoplasm," described at about the same time by Geber and Duhring, the latter says: "Under the microscope the disease is seen to consist of a profuse, closely packed, small, round-cell [? small-round-cell] infiltration, completely occupying the corium and the subcutaneous tissues. The cells are small, variable as to size and shape, compact and shining, and finely or coarsely granular. The larger ones show nuclei. They are variously arranged, in the form mainly of dense aggregations, or in strings or columns, the latter following the course of the fibrous connective tissue." During the first year of its course the case reported by him showed marked inflammatory symptoms; hence the name given to it. At a later period, however, the microscope showed the process to be rather of a sarcomatous and fibro-sarcomatous nature.

Besides the added sections, some of the old ones have been amplified—notably those on Dysidrosis and Pompholyx, Hæmatidrosis, Scleroderma, Morphœa, Hypertrophy of the Hair, Atrophia Cutis, Atrophy of the Hair, Scrofuloderma, Syphiloderma, and Carcinoma.

The author can not account for the discordant views that have been expressed in regard to dysidrosis and cheiro-pompholyx, except by supposing that two distinct diseases have been confounded. He states that he is familiar with one form, manifestly affecting the sweat apparatus; and with another, in his opinion in no wise connected with it. The one answers to the dysidrosis of Tilbury Fox, the other to the cheiro-pompholyx of Hutchinson. On p. 371 Dr. Duhring says, speaking of scleroderma: "The disease is usually symmetrical." On p. 375 he says: "Scleroderma does not show symmetry." He thinks that many, if not all, cases of unilateral atrophy of the face should be classed as a form or variety of morphœa. For the destruction of superfluous hairs he considers electrolysis the best method.

The author thinks that many cases of the xeroderma of Hebra should be grouped with morphœa or scleroderma. From the study of a mild case, he is inclined to think (contrary to Dr. R. W. Taylor's observations, which are quoted with evident appreciation of their importance) that in that instance the pigmentary lesions occurred first, being followed by the telangiectases, which in turn were replaced by the atrophic macules. "Piedra" is considered to be a distinct disease from trichorexis nodosa.

The section on scrofuloderma is quite meager, and is devoted largely to the cutaneous implication in cases of suppurating glands, while the scrofulides of the French and the ulcerative scrofuloderm are discussed in other parts of the book. A variety of disease, the lesions of which bear a general likeness to those of the small-pustular syphilide, the author views as a scrofulous manifestation, and states that he has never seen any account of it in literature. We can not but look upon Dr. Duhring's consideration of the scrofulides as unsatisfactory. The syphilides are well described, and in particular the diagnosis of the squamous syphilide from psoriasis is very cleverly put. The author admits the existence of the pigmentary syphilide, following, in his short account of it, mainly the descriptions of other writers.

Dr. Duhring's descriptions of disease are correct and clear. It is to be regretted that they are not also vivid. In this regard the book falls behind some of the other text-books in common use, but its comprehensiveness makes it, we think, as good as any of the works designed for the general practitioner.

Columnæ Adiposæ, a newly described Structure of the Cutis Vera, with its Pathological Significance in Carbuncle and other Affections. By J. Collins Warren, M. D., Instructor in Surgery, Harvard University, etc. Cambridge, 1881. Pp. 28.

The "columnæ adiposæ" described by Warren are prolongations of adipose tissue which ascend from the subcutaneous cellular tissue, between the fibers of the cutis, which they separate, to the follicles of the lanugo hairs. They are best shown where the skin is thickest, as over the scapular regions of the back. Forced injections of these columnar spaces were made with Prussian blue. A piece of skin was stretched over the end of a cylinder, and the injection was made from beneath by means of compressed air. Such injections showed two little branches or arms passing from the columns into the substance of the cutis, connecting with the lymph spaces in the cutis, and anastomosing with other columns.

It is claimed that these structures play an important part in carbuncle and other affections of the skin (such as sarcoma and nævus). In carbuncle, microscopic examination showed that the pus ascended by way of the adipose columns to the hair follicles, by the side of which it finally "pointed." This, together with other appearances, indicates that the disease is due rather to a spreading phlegmonous inflammation of the cellular tissue than to an inflammation developing in a number of adjacent foci.

Compendium of Microscopical Technology. A Guide to Physicians and Students in the Use of the Microscope and in the Preparation of Histological and Pathological Specimens. By CARL SEILER, M. D., late Director of the Microscopical and Biological Section of the Academy of Natural Sciences of Philadelphia, etc. Philadelphia: D. G. Brinton, 1881. Pp. 130.

THE object of this manual is to set before the student only such methods and modes of procedure as have been most successful in the hands of the author. It naturally, therefore, bears the marks of individuality, though not of any originality. The author has been very successful in the treating of microscopic sections, and he here attempts to give, in a clear and lucid manner, what he has found best. We do not entirely agree with him in all his preferences. We have ourselves found hæmatoxylon more valuable than, and as permanent a staining fluid for tissues as, carmine. But this difference is, perhaps, owing, as in other processes in the laboratory, whether it be in the department of physiology, of chemistry, or of histology, etc., rather to skill and experience acquired from the more frequent use of a particular process than to any special superiority of the one process over the other.

The manual differs from most others upon this subject in that it does not confuse the beginner by giving him a dozen different processes for accomplishing the same purpose, and thus leave the tyro in a state of uncertainty as to which method had better be pursued. Multiplicity of methods never leads to skill in any one method, but very often to failure and disgust at the difficulties to be overcome.

We commend this little volume to students in medicine, feeling that, if they have acquired experience in the simple course laid out by the author, they will have the aptitude to attempt such other methods as have proved successful in the hands of others.

Hand-book of Chemical Physiology and Pathology, with Lectures upon Normal and Abnormal Urine. By VICTOR C. VAUGHAN, M. D., Ph. D., Lecturer on Medical Chemistry in the University of Michigan, etc. Third edition, revised and enlarged. Ann Arbor: Ann Arbor Printing and Publishing Co., 1880. Pp. 351–32.

THIS book, the author says, has no claim to completeness, but is given as a guide to the student. It has been especially prepared for the use of the students of the author, and embraces the work done by them. As such, it represents a large amount of most excellent work, and speaks well for the institution whose students have obtained practical acquaintance with the more important facts in physiology.

A brief consideration of the Saliva, Gastric Juice, Pancreatic Juice, and Bile, in which the tests for their constituent elements and some remarks upon their general physiological action are furnished, opens the volume.

In the succeeding pages, on the Fæces, we observe the remark that Flint's stercorine is impure cholesterine (Hoffmann). The author does not give preference to either of the theories for blood coagulation, merely stating them. Considering the careless manner in which the microscopic examination of the blood for the determination of the increase of the white corpuscles is often made, the author's observation that the proportion of the white and red in the morning before breakfast, and in the afternoon, shows variations from 1–1,800 at the former hour, to 1–200 at the latter time, is worthy of being well kept in mind.

Spermatic Fluid, Lymph, and Chyle receive brief notice, and Milk a more extended one. In the case of the latter the tests for its most common adulterations are given, the author evidently believing in the lactometer.

After a discussion of a few of the more important remaining proximate principles, the remainder, forming almost one half of the entire volume, is devoted to the subject of the Urine, treating in great detail of its composition, its tests, and the normal and pathological conditions which influence it. Throughout the work the author has freely tried to deduce practical conclusions from his physiological investigations, and we find here remarks rather intended to make the laboratory instruction more interesting by expressing personal experience and views, than to furnish opinions held by others than the author. Evidence of devotion to the subject treated of is shown throughout, and certain themes, in which the writer has evidently labored most, are ably treated. We give our commendation to the work as a hand-book, though the detailed manner of treatment of some subjects will bring it into competition with such preëminent works on physiology as the recent work of Gamgee.

An Elementary Treatise on Practical Chemistry and Qualitative Inorganic Analysis, specially adapted for use in the laboratories of colleges and schools and by beginners. By Frank Clowes, D. Sc., Lond., etc. With Illustrations. From the third English edition. Philadelphia: Henry C. Lea's Son & Co., 1881. Pp. 372.

The idea of this work is an excellent one, combining, as it does, in moderate compass, the two things which a beginner needs, and which are all that the ordinary medical student or practitioner ever obtains—i. e., "practical experience in chemical experiments," and a "simple course of qualitative analysis."

In reviewing its pages we are struck by the reiteration of a statement which is very unwarranted. Among the tests for sodium, the flame or color test is recommended as the most reliable (pp. 95 and 98). It is a grave fault to give a beginner the flame reaction as *the* test for sodium, and not caution him of the fact that this reaction may be obtained from almost anything, on account of the wide distribution of sodium and the extreme delicacy of the test. The simple and easily applied test of slowly evaporating the solution with excess of $Pt Cl_4$, and observing the very characteristic prisms with the naked eye or lens, is as perfect in result in the presence of KCl or NH_4Cl, as with the pure NaCl.

Whether we can agree with the author's statement, in his preface, that he was encouraged to proceed with the publication because the want of a sufficiently elementary and explanatory text-book was very widely felt, in view of the many other works of nearly the same scope, needs no discussion. The book, however, seems good and well adapted to its purpose.

Medical Diagnosis, with special reference to Practical Medicine. A Guide to the Knowledge and Discrimination of Diseases. By J. M. Da Costa, M. D., Professor of Practice of Medicine and of Clinical Medicine at the Jefferson Medical College, Philadelphia, etc. Illustrated with engravings on wood. Fifth edition, revised. Philadelphia: J. B. Lippincott & Co., 1881. Pp. 924. [Price, $6.]

We need do little more than inform our readers that a new edition of Dr. Da Costa's great work has been issued. The art of diagnosis advances so rapidly, and the author brings his book so thoroughly up to date, that those who know the excellence of former editions (and we trust that few do not) will doubtless lose no time in possessing themselves of the new issue.

Drugs that Enslave. The Opium, Morphine, Chloral, and Hashish Habits. By H. H. Kane, M. D. Philadelphia: Presley Blakiston, 1881. Pp. 8–17 to 224, inclusive. [Price, $1·50.]

In the present work the author has pursued the same plan which he followed in writing "The Hypodermic Use of Morphine." Careful reading has been combined with a system of correspondence by which the views of a thousand medical men in different parts of this country and Europe have been obtained. As a result, the present work certainly exhausts the subject, looking at it from all possible points of view; this is especially true of the opium and chloral habits, hashish eating seeming from its rarity in this country to deserve a less extended notice. Physicians who are treating troublesome cases of this nature will find it very gratifying to read something so much fuller than the notice given to the subject in ordinary text-books.

Report on Education. By E. Seguin, United States Commissioner on Education at the Vienna Universal Exhibition. Second edition. (Authorized and revised by the author.) Milwaukee, Wis.: Doerflinger Book and Publishing Co., 1880. Small 8vo, pp. 215.

The late Dr. Seguin found the Section of Education of the Vienna Exhibition so incomplete as to seem to preclude, at first sight, the idea of making any report upon it, the most important data being missing, for various reasons, from the school collections; but he finally concluded to gather in and out of the *Welt-Ausstellung* as many facts as circumstances would permit, and to form from them a more or less complete judgment.

After chapters on the Cradle and the Crêche, or Public Nursery, the Salle d'Asyle, the Kindergarten, the Physiological Infant School of the Future, and on the Education of the Senses, a considerable portion of the work is devoted to the education of deaf-mutes and idiots, the author believing that some of the methods used in overcoming the apparently impassable barriers which separate these children from the rest of the world can also be applied to ordinary children. Part 4, comprising the latter half of the work, completes the view of Popular Education as it is and as it should be, with School Organization and Sex in Education. Under these various headings education is treated of historically, philosophically, and practically, some portions of the materials having been gathered as early as the year 1839, and certain fragments published before 1846; and, though Dr. Seguin's peculiar English sometimes strains the attention, and may even occasionally provoke a smile, the book is exceedingly interesting as well as instructive, not merely to the expert, but to all who have to think of the subject; and who has not?

Hand-Book for Coroners: containing a Digest of all the Laws in the thirty-eight States of the Union, together with an Historical Résumé from the earliest period to the present time, a guide to the Physician in Post-mortem Examinations, etc. By John G. Lee, M. D., Coroner's Physician of the City and County of Philadelphia. Philadelphia: William Brotherhead, 1881. Pp. 288.

In this compilation, Dr. Lee states that he has been actuated by a desire "to fill a void" existing in American medico-legal literature, and, if it be customary in this country (as the ordinary results of coroner's inquests might lead one to suppose) for medical gentlemen to undertake public pathological investigations with only such information as they can derive from a single book of domestic manufacture, the present manual may serve a useful purpose. Those, however, who have given even a limited amount of attention to medical jurisprudence and morbid anatomy will find themselves on the oldest and most familiar ground, and will, moreover, miss not a few of the things with which they have long been familiar. The first chapter gives a brief summary of the history of coroner's law from early times; the second, after sketching the rise and progress of "the coroner's physician," continues with the traditional advice concerning the deportment of the medical witness, and the conventional directions for making a post-mortem examination or supervising an exhumation, with a couple of sample reports of autopsies. The third chapter treats briefly of the "aspects and surroundings of death" from a medico-legal point of view, but does not bring the interpretation of these up to a very recent date. The most useful part of the book follows, rehearsing the various State laws relating to coroners' inquests; and the most useless, in a series of stale and *banal* newspaper anecdotes.

Recueil des Travaux Chimiques du Dr. Domingos Freire, Professeur Titulaire de Chimie Organique à la Faculté de Médecine de Rio de Janeiro, etc. Suivi des Recherches sur la Cause, la Nature, et le Traitement de la Fièvre Jaune, par le même auteur. Avec figures dans le texte. Rio de Janeiro: Molarinho & Mont Alverne, 1880. Pp. 335–ix.

A series of papers upon disconnected chemical subjects of more or less interest, such as: On the action of various oxidizing agents upon natural alkaloids; Researches with reference to the rancification of butter, etc. This is followed by a discussion of yellow fever, in the course of which the author claims to have discovered a special organism in the blood and vomited matters, and insists most enthusiastically upon the cure of the fever with hypodermic injections of salicylate of sodium. He believes that the salicylate of sodium acts chemically by destroying the organism which he has discovered and upon whose presence he believes the fever to depend. The author's style and manner of presenting his ideas are too florid and dramatic to be impressive or convincing.

Hand-book of Systematic Urinary Analysis, Chemical and Microscopical. For the use of Physicians, Medical Students, and Clinical Assistants. By Frank M. Deems, M. D., Laboratory Instructor in the Medical Department of the University of New York, etc. New York: The Industrial Publication Co., 1880. Pp. 30.

A very short, clear, and simple recapitulation of the important facts connected with urinary analysis, including all that most physicians are called upon to make use of. If a hand-book is to deserve its name, it should be short. Nothing is more objectionable than works which are too short to be exhaustive, and too long to be glanced over readily. The present work is essentially a hand-book.

Books and Pamphlets Received.—A Text-Book of Practical Medicine, with Particular Reference to Physiology and Pathological Anatomy. By Dr. Felix von Niemeyer, Professor of Pathology and Therapeutics, Director of the Medical Clinic of the University of Tübingen. Translated from the eighth German edition, by special permission of the author, by George H. Humphreys, M. D., one of the Physicians to Trinity Infirmary, etc., and Charles E. Hackley, M. D., one of the Physicians to the New York Hospital and Trinity Infirmary, etc. Revised edition. New York: D. Appleton & Co., 1881. Two vols., pp. xvi–767; ix–861. [Price, $9 cloth; $11 sheep.] ═══ A Treatise on the Diseases of the Nervous System. By William A. Hammond, M. D., Surgeon-General, U. S. Army (retired list), etc. With 112 illustrations. Seventh edition, rewritten, enlarged, and improved. New York: D. Appleton & Co., 1881. Pp. 929. [Price, $5 cloth; $6 sheep; $6 half russia.] = On Anchylosis, and the Treatment for the Removal of Deformity and the Restoration of Mobility in Various Joints. By Bernard E. Brodhurst, F. R. C. S., Surgeon to the Royal Orthopædic Hospital, etc. Fourth edition. London: J. & A. Churchill, 1881. Pp. xi–100. = Mr. Spencer Wells's Note-Book for Cases of Ovarian and Other Abdominal Tumors. Sixth edition. London: J. & A. Churchill, 1881. Pp. 25. = Report on the Composition and Quality of Daily Samples of the Water supplied to London, etc., No. III. By William Crookes, F. R. S., William Odling, M. B., etc., and C. Meymott Tidy, M. B., etc. London: Wertheimer, Lea & Co., 1881. = *Idem*, No. IV. = Census Bulletin. Nos. 149 to 156, inclusive. = Beiträge zur Mechanik der Herzbewegung. Von Dr. Fr. Hesse. [Reprint.] = Clinical Illustrations of Favus and its Treatment by a New Method of Depilation. By L. Duncan Bulkley, M. D., etc. [Reprint.] = Antiquities of the Missouri Bluffs. By S. V. Proudfit. [Reprint.] = Simple Methods to stanch Accidental Hæmorrhage. By Edward Borck, M. D. [Reprint.]

Proceedings of Societies.

NEW YORK OBSTETRICAL SOCIETY.

A REGULAR meeting was held May 3, 1881, Dr. JAMES B. HUNTER, President, in the chair.

FIBRO-CYST OF THE FALLOPIAN TUBE.—Dr. THOMAS presented a specimen which had been removed from a woman about thirty-eight years of age under the following circumstances: He was called to Saratoga Springs to perform the operation of ovariotomy upon a patient whom he had not seen. The tumor, which was a large one, estimated to weigh at least forty-five pounds, was removed without difficulty, and the patient got entirely well. After removing the tumor, he passed his hand down into the pelvic cavity to examine the other ovary, and found a tumor as large as a hen's egg attached to the Fallopian tube. After tying its base he removed it. On cutting into it, its walls were found to be thick, and appeared to be composed of muscular tissue, such as exists in the walls of the tube; in the center there was an ounce or an ounce and a half of purulent-looking fluid. Since the walls of the Fallopian tube were composed of the same muscular structure as those of the uterus, and since fibroid tumors occurred in the latter organ, he saw no reason why they might not be found in the former, although he knew of no instance of the kind on record. This tumor certainly had the general appearance of a cystic fibroid, and he would refer it to the pathologist for a microscopical examination. The case also illustrated the importance of carefulness in making a diagnosis attended by a grave prognosis. An eminent gynæcologist had made the diagnosis of cancer of the ovary, and said that an operation would certainly be followed by death; the patient's friends, therefore, would not consent to ovariotomy without strong assurance that there was no evidence of cancer. ═══ Dr. Foster remarked that fibrous tumors had been known to originate in the uterus, become detached, and subsequently become adherent to other organs; and he asked if such might not have been the case in this instance. ═══ Dr. Thomas replied that they might become attached to almost any organ in the abdominal cavity, as the liver, the spleen, stomach, colon, etc., and possibly such was the origin of the tumor of the Fallopian tube in this case, but he thought otherwise.

Uterine Fibroid.—Dr. Hanks presented a fibroid tumor, about four and a half inches in diameter, which he had removed from the uterus of a woman thirty-five years of age, the mother of one child. She had become considerably emaciated, and suffered from menorrhagia and metrorrhagia, and, on account of mental depression, she was in a worse condition than were many women with a more serious affection. In consultation, Dr. Thomas had confirmed the diagnosis of submucous fibroid of the cervix and body, and advised an operation for its removal; Dr. Lee was not positive in his own opinion that it was simply submucous in character. The tumor was imbedded chiefly in the posterior cervical wall, its implantation extending, however, above the internal os. As the cervix could not be sufficiently dilated for free manipulation, a slight incision was made into the anterior lip, a little to the right of the median line, and the capsule of the tumor was incised and the whole of it removed with Thomas's serrated scoop. The part which was attached above the internal os was difficult to reach on account of the narrowness of the cervix. This part, therefore, had to be enucleated more slowly by means of the finger, which could be bent at a more acute angle than the serrated scoop. Finally the last fibers of attachment were severed by torsion with a strong vulsella forceps. There was considerable hæmorrhage, which Dr. Hanks checked by the application of styptic cotton, a material, however, which he would never apply again, on account of the difficulty of removing it, and the danger attending its prolonged stay in the uterus. The patient had a severe attack of septic poisoning, but by care and frequent injections of antiseptic fluids she made a perfect recovery, and went to her home in Newark, New Jersey, in her own carriage, three weeks after the operation. ═══ Dr. Thomas remarked that he had seen the case with Dr. Hanks, and, owing to the difficulties attending the operation, he considered the removal of the tumor one of the triumphs of surgery; that as much or more skill was required than, in many instances, to perform ovariotomy. The patient must have died had the tumor not been removed. In reply to a question by Dr. Hanks, as to what he used to stop hæmorrhage in such cases, he said he employed a tampon wet with alum solution. ═══ Dr. Foster suggested for this purpose the use of lamp-wicking, which he found very convenient for tamponing the vagina, being continuous and easily removed. It could be medicated according to the needs of the case. ═══ Dr. T. A. Emmet remarked that hæmorrhage could almost always be controlled in such cases after operation by injections of hot water, followed, if necessary, by the application of Churchill's tincture of iodine. He had met with but one case in which he had found it necessary to tampon the cavity with cotton, and this was in consequence of the growth being situated entirely within the cervix. He thought that, as a rule, it should not be done, so that free drainage might take place after the operation. When, however, the tumor, or the principal portion of it, was in the cervix, where the cavity could not be reduced in size, or the hæmorrhage arrested by the uterus contracting upon the bleeding vessels (as seemed to be true in Dr. Hanks's case), a tampon might be called for, and as a styptic alum was certainly far preferable to persulphate of iron, for the latter, by causing the formation of dense clots of blood, which were prone to early decomposition in a position convenient for absorption, caused great danger of blood poisoning.

FIBROID TUMOR OF THE UTERUS.—Dr. JANVRIN also presented a fibroid tumor, which he had removed the week before from the anterior wall of the uterus in a mulatto woman of about fifty-two years of age. The tumor had existed, he was told, for five or six years, and had caused menorrhagia, and more recently metrorrhagia. It presented through the cervix, and the upper portion was nearly on a line with the fundus of the uterus. Its pedicle was very large. He removed it with the écraseur close up to the uterine wall, and after the operation applied iodine and tamponed the vagina with cotton. The patient made a perfect recovery. The tumor felt as if it were somewhat of a fatty character. It was referred to the pathologist. ═══ Dr. B. McE. EMMET thought it appropriate, in this connection, to raise the question as to the best time to operate in such cases; should they be operated upon as soon as the tumor was detected, or should the operation be delayed until the tumor became of some size, or until the symptoms demanded it? These considerations were suggested by a case at present under his care, which had first come under his observation some two years ago. At that time he discovered a growth at the fundus of the uterus of irregular conformation and without well-defined limits. The patient's general health was such also that any surgical interference was out of the question, although she was suffering from metrorrhagia and intense uterine pains. In the past two years her general health had received careful attention, and every effort had been made to bring the growth down toward the cervix, at the same time controlling the hæmorrhage, so that now there could be no doubt as to the features of the tumor and the propriety of removing it, the patient at present being well able to bear what would previously, in all probability, have proved fatal. ═══ Dr. T. A. EMMET, referring to Dr. Janvrin's case, asked if tumors having a broad pedicle should not be drawn down as much as possible, in order to reduce the size of the attachment by exciting contraction of the uterus before applying the écraseur, thus lessening also the extent of the denuded surface from which absorption of septic elements might take place. In regard to Dr. B. McE. Emmet's question, it was his general rule to remove such growths as soon as he could get at them. ═══ Dr. THOMAS said it was his custom always to pull the tumor out of the uterus before operating, if possible, and even formerly, when he used the écraseur, he did so. ═══ Dr. JANVRIN said such also was his custom, whether in using the écraseur, the galvanic cautery, the scissors, or other instrument; and in this instance he pulled down upon the tumor for twenty minutes before proceeding with the operation. ═══ Dr. T. A. EMMET remarked that some years ago he removed a uterine fibroid close to the uterine wall, as he supposed, but the patient afterward died of blood poisoning, and at the post-mortem it was found that as the uterus contracted a portion of the tumor had been left, which became pedunculated, and decomposition took place, which resulted in blood poisoning. It was that case which first drew his attention to the importance of making traction upon the tumor to excite uterine contraction, thus lessening the size of the pedicle, which would insure complete removal and lessen the risk of septic poisoning.

DYSMENORRHŒAL MEMBRANE.—Dr. HANKS presented a specimen which Dr. Sparhawk, of St. Johnsbury, Vermont, had sent him, with the statement that it came from a woman who was subject to menorrhagia and dysmenorrhœa, and who had been treated in Boston, where the uterus was twice curetted. The specimen looked like a lining membrane of considerable size, but he had not examined it carefully, and would refer it to the pathologist.

FORMATION OF A URETHRO-VAGINAL FISTULA AS A DIAGNOSTIC AND THERAPEUTIC MEASURE.—Dr. T. A. EMMET referred to an operation as follows: A woman had symptoms of trouble with the urethra, or at the neck of the bladder. Neither with the endoscope, nor with any other ordinary means. could a satisfactory examination of the canal be made in such cases. He therefore made a button-hole opening into the urethra, beginning at a short distance behind the external meatus, and extending along the canal to the neck of the bladder, but not close enough to involve it. He had recently operated in a case in which he found that the mucous membrane was redundant and the submucous tissue thickened, the former being thrown into longitudinal folds which almost occluded the canal—a condition which the endoscope did not show, as it passed between the folds. There was also a urethrocele. He removed the superfluous mucous membrane, and united the cut edges of the urethral mucous membrane with those of the vagina by interrupted sutures of fine carbolized silk. The after-treatment consisted chiefly in the application of warm water by injection, so as to keep the parts clean. He had operated in this manner in a number of instances, both for the removal of symptoms and for purposes of diagnosis, and he considered it often the best means, and in some instances the only means, of bringing about a change in the nutrition of the parts. He referred to a case in which he had performed the operation for Dr. Jenkins, two physicians before them, skilled in genito-urinary affections, having failed to make the diagnosis; and it was found that a number of small polypi, one of which was attached at the neck of the bladder, were the source of irritation, and with their removal the irritation ceased. It afforded the only means of effecting a radical cure of any disease of the mucous membrane of the urethra, as the remedy could be applied to a surface which could be brought into view. The wound was left open several weeks, or until the tissues had been restored to a healthy condition, and then closed as a fistula would be closed.

CYSTS OF THE CERVIX UTERI FILLED WITH AIR.—Dr. T. A. EMMET also narrated a case as follows: A patient, upon whom Dr. J. R. Ripley had operated for a deep laceration of the cervix, some months ago, had returned to him recently, and, on making an examination, he detected with the finger a number of supposed cysts on the cervix. When he punctured one of them, it was found to be distended with air, which escaped with an explosive sound like that from suddenly crushing an inflated paper bag. Dr. Emmet had been shown the case by Dr. Ripley, and he found a number of such air-sacs, varying in size from that of a millet-seed to one as large as a cherry-stone. He had seen reported somewhere one or two instances of like collections of air in the vaginal tissue, but never in the cervix. He supposed they were originally ordinary cysts, the contents of which had undergone decomposition in some way and left the sac distended with air. He asked if any of the members present had seen such, or the report of a similar case. Dr. Noeggerath and Dr. Thomas replied in the negative.

THE QUESTION OF RETREATING AFTER OPENING THE PERITONÆUM FOR THE REMOVAL OF TUMORS.—Dr. JANVRIN said that he was requested by Dr. Bozeman to assist him on Wednesday last, at the Woman's Hospital, in an operation for the removal of an abdominal tumor, probably ovarian. Cutting down upon it, it was found to be solid and attached by a pedicle to the central posterior portion of the uterus, and also to the colon, to the small intestine, the broad ligaments and ovaries, and to the anterior and posterior walls of the pelvis. The question then arose as to the propriety of retreating and closing up the abdominal wound; but, at the urgent request of Dr. Janvrin, the operation was proceeded with, and the tumor was enucleated from its sac, to which it was rather loosely attached, its pedicle transfixed and ligated, and the tumor removed through the large abdominal incision, which extended from about the symphysis pubis to above the umbilicus. The tumor was as large as a man's head, and, owing to the great extent of surface to which it was attached, considerable oozing of blood attended its removal, but no large vessels were broken, and it was necessary to ligate but two small ones. The pedicle was transfixed and a ligature was applied as to an ordinary ovarian pedicle; the peritoneal cavity was sponged out and closed at once, a glass drainage tube being left in. The patient had organic disease of the heart, mitral regurgitation, and considerable hypertrophy. She rallied from the shock, however, and did well for sixteen hours, when the temperature began to rise, the pulse increased in frequency up to about 115, the respirations rose to 23, peritonitis developed, and she died forty hours after the operation. There were two points of interest in the case: First, the question whether the tumor should have been removed after the incision had been made and its nature and attachments determined; and, secondly, its attachment by a pedicle to the posterior wall of the uterus. He had never before seen a simple fibroid attached in that manner, although he and Dr. Emmet assisted the late Dr. Peaslee in a case somewhat similar, many years ago, at Astoria. A diagnosis was made of ovarian tumor, but it proved to be a large fibro-cystic tumor, attached to the fundus of the uterus by a pedicle of about the same size as in the case just referred to—viz., about an inch and a half long and of an equal diameter. He thought that, in Dr. Bozeman's case, the patient would not have recovered from the exploratory incision, even had the tumor not been removed. ═══ Dr. T. A. Emmet said he saw the case before the operation, and thought, with the rest of those who examined the tumor, that it was ovarian, because it was so perfectly movable. The same was true in Dr. Peaslee's case; there was every reason to believe that it was an ovarian tumor. These two cases illustrated the difficulty of diagnosis, and the impossibility of making a positive one in many instances. The more cases he saw, the less positive was he in his diagnosis. He believed that, as a rule, when the abdomen was opened, a retreat should not be made. The tumor should be removed; for death was likely to result from the exploration, and, if it did not, it would, soon, from the growth; so it was better to give the patient a chance of complete recovery by removing the growth. ═══ The President remarked that he once removed a large pedunculated fibroid attached to the fundus of the uterus, and the patient recovered; but the tumor was not adherent to other organs.

Hæmorrhage at the First Menstrual Flow.—Dr. Pallen was called, in the latter part of February, to see a girl, fifteen years old, menstruating for the first time, who had an excessive flow. He found her feeble, and very much prostrated. He was shown some large clots of blood, which indicated that she had had a severe hæmorrhage—doubtless, however, less than her friends supposed. He proposed a vaginal examination, but it was denied him, and he then refused to treat the case, but gave the parents some general advice, and told them to have their daughter looked after. The hæmorrhage gradually ceased, but left the girl very much prostrated, and he was again requested to take charge of the case.

He found, upon careful examination, that she was in a hydræmic state. There were souffle sounds at the base of the neck, and the pulse was small and feeble. He put her immediately upon the use of "boema," a preparation of beef's blood. which he considered a most valuable food in prostration after hæmorrhage; and also upon Gaunt's beef, peptone, quinine, wine, and a tonic treatment in general. The girl had profuse leucorrhœa and a naso-pharyngeal catarrh with a cough. Her next menstrual flow was ushered in rather less profusely, but in two or three days it became excessive, and he was sent for in haste. A local examination was granted, and, on introducing the small blade of a very small Sims's speculum, he discovered a condition of the cervix which resembled very closely the catarrhal condition of the naso-pharyngeal mucous membrane, and from its surface, which was denuded of epithelium, there oozed forth blood, not unlike great drops of bloody sweat. He applied the compound tincture of iodine, and introduced a tampon of cotton, with a quill communicating with the cervical canal, so as to allow of free drainage if there were still any menstrual flow, and thus avoid uterine colic; but he believed that most of the hæmorrhage came from the denuded mucous membrane of the vaginal cervix. This process was repeated once daily for three days, after which injections of hot carbolized water were used. To the denuded surface, from which blood continued to ooze occasionally for nine days, he applied the compound tincture of iodine, solution of the nitrate of silver, etc., and gave tonics internally, and the most nourishing food. The girl now had her third menstrual epoch, and it was nearly normal. He mentioned the case as showing the importance of making an examination, and discovering whether or not a hæmorrhage supposed to be an excessive menstrual flow might not be due to some other cause.

New Operation for Cystocele and Prolapsus of the Bladder.—Dr. Noeggerath prefaced the description of an operation which he had performed by saying that the ordinary operation for prolapsus of the anterior wall of the bladder, due to relaxation of the tissues, was usually successful, but not so in cases of cystocele in which the vaginal wall, upon which the bladder rested, was thin, and the walls of the bladder itself were in a state of eccentric hypertrophy, especially if the subject, as was usually the case, were a woman past fifty. Such a case presented itself to him last autumn in an old woman in whom the prolapsed tumor was as large as a child's fist. He did not think it safe to do a protracted operation with the patient under the influence of ether, for she had atheromatous degeneration of the arteries and stenosis at the aortic opening. He had noticed that the bladder often regained its former tone after the closure of a fistula, and this fact suggested the idea that a simple incision into it might effect the same result; but something should be done to prevent the incision healing up immediately. He accordingly made an incision above the neck, and then cauterized both angles of the wound, and thus kept it open for two months. The bladder regained its normal tone and became reduced to its natural size, and the prolapsus was entirely reduced, notwithstanding the existence of a laceration of the perinæum causing some prolapsus of the anterior wall of the vagina.

Ovarian Tumor treated by Incision and Drainage.—Dr. Thomas related a case of this sort, the history of which appeared in the June number of the "Journal," p. 625.

Reports on the Progress of Medicine.

MONTHLY REPORT ON OBSTETRICS AND GYNÆCOLOGY.

No. VI.

By FRANK P. FOSTER, M. D.,
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64. Haussmann, D.—Zur Entstehung und Verhütung der Ophthalmia neonatorum. *Ibid.*, Apr. 30, 1881.

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66. Reed, B.—Icterus neonatorum and its relations with umbilical hæmorrhage. "Med. and Surg. Reporter," Mar. 26, 1881.

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16. Lerch's article on *dystocia from abnormalities of the cervix uteri* constitutes a useful summary of our present knowledge of the behavior of the cervix during pregnancy, and of the various abnormal conditions pertaining to it that may give rise to dystocia. The latter include closure and stenosis, rigidity, spasmodic stricture, and tumors.

21. Dr. Stuart cites the views of various well-known authors in regard to *laceration of the perinæum*, its importance in the etiology of pelvic disease, the methods of preventing it, and the treatment to be pursued when it has occurred. He accepts the ideas of Savage and Thomas as to the anatomy of the part, and seems to agree with Goodell in the recommendation to relax the perinæum during the expulsion of the head by drawing the tissue down from behind. He warmly advocates the primary operation, recommending the carbolized-silk ligature of Simon or silver wire, regarding the use of *serres fines* as inadequate, since, as he thinks, they can simply hold the skin together. The arguments put forward in favor of the immediate operation are: (1) the patient is not kept in bed longer than she otherwise should be, whereas, if the secondary operation is performed, she is put to bed again for at least two or three weeks; (2) unless immediate union is secured, loss of tissue takes place—by ulceration at the time, and afterward by paring the surfaces at the secondary operation; (3) the primary operation is more uniformly successful than the secondary; (4) in the natural process of repair deformity is almost always left, this having been found by Dr. Reamy, of Cincinnati, in every one out of six hundred cases examined by him; (5) a raw surface is closed which might otherwise absorb septic material. ═══ In the discussion, Dr. Skene questioned the utility of the method of protecting the perinæum known as Goodell's, but really not originally his. He did not see how any increase of elasticity, or any gain of tissue, was to be secured by bringing the perinæum forward, because it would have to pass backward before the head could emerge. It was no doubt true, however, that pressure could be made to prevent a too early extension of the head, thereby guarding against rupture to a great extent. The speaker called attention to a serious class of cases in which the substantial structure of the perinæum was injured without there being necessarily any superficial solution of continuity. He doubted if, in the hands of experts, the remote operation failed as often as the immediate one did in the hands of general practitioners. The great cause of failure to restore the tone of the part by a secondary operation, if long delayed, lay in the fact that by long disuse the muscular tissue had lost its contractile power, as always happened to muscles that had lain idle for a lengthened period. ═══ Dr. Chapman stated that his own observation confirmed Tyler Smith's statement, that rupture occurred more rarely to women attended by midwives than to those who were delivered under the care of a physician. The inference was, that the methods commonly in use to prevent laceration were worse than none at all.

25. In this very readable article on *the prevention of laceration of the perinæum*, Dr. Landis questions the soundness of the doctrine that the injury is due to rapidity in the second stage of labor, and remarks upon the futility of the practice, founded thereon, of attempting to stay the onward progress of the head. He implies, however, that it may be well to secure the patient's abstinence from bearing down efforts. [How far she can control the impulse to bear down, under such circumstances, seems to us questionable.] He describes a peculiar form of distention of the perinæum that he has met with in a few instances—always in primiparæ: About a finger-breadth in the median line, extending from vulva to anus, is smooth tissue and quite thin, while on either side of this the perinæum is thick and elevated, looking not unlike the labia majora on a small scale. The median strip appears to be the only dilatable part, and, in spite of all precautions, more or less of a tear occurs as the head escapes. He infers that this condition of the parts is owing to a congenital or developmental defect, the lateral thickening being due probably to adipose deposit. He gives the following method of managing this state of things, although he has almost abandoned it as futile: "The ball of the thumb is pressed upon one of the nates, and the skin, etc., is crowded over toward the perinæum, while the fingers, reaching across, pull the skin of the opposite buttock in a similar direction. In this way we crowd skin and cellular tissue into the perinæum and afford a larger distensible surface. We can not increase the size of the perineal body or muscles, but by increasing the thickness of the cutaneous covering may add a little strength to the whole structure."

27, 28. A great portion of Credé's article on *the proper method of removing the placenta* is given up to proving that his previous descriptions of his method of expressing the placenta do not warrant the interpretation that underlies the criticisms of Dohrn, Runge, and Schultze. [These criticisms, together with Credé's preliminary reply, have already been summarized in our Reports.] The author states that he was led to adopt the method by expression, not by theoretical considerations, but by having observed, somewhat as a matter of accident, the uniformity with which the placenta was expelled as the result of the moderate degree of manipulation of the uterus through the abdominal wall employed in the mere examination made to ascertain the condition of the organ. These examinations were made in cases of post-partum hæmorrhage with retained placenta, to which in his early experience, while in charge of the Berlin Obstetrical Polyclinic, he was summoned very frequently. He soon began to apply the method to all cases of labor in which the expulsion of the placenta did not immediately follow that of the child; but, as it took him several years to attain perfection in the manipulation, he admits that his early teachings in regard to it may not have been explicit enough to prevent the confusion that has arisen about it. He still has nothing to add, however, to the description given in the article published by him in 1860. The following passage from that article will show how unfair it is to hold up as the cardinal point of Credé's method the immediate expression of the placenta: "A matter of prime importance is just the proper time to make use of pressure with the hand. We should first lay the outspread hand gently upon the region of the uterus, and begin with quite delicate stroking movements over as large a portion of the uterus as possible, until we perceive under the hand the beginning of a uterine contraction; we then grasp the uterus between the hand and the outspread fingers, or, if need be, with both hands, and, at the moment when the contraction seems to have reached its greatest energy, we press boldly upon the fundus and walls of the uterus in a direction toward the hollow of the sacrum. . . . To try to expel the placenta by pressing on the uterus when there was no contraction would be futile." Usually the expulsion of the placenta can not be accomplished with the first contraction, but very often it can with the second, and almost invariably with the third or fourth. The author thinks that the natural expulsion of the placenta is generally effected in the manner described by Duncan, although the mechanism portrayed by Schultze may sometimes come into play. At all events, whether the mass is bellied by an accumulation of blood behind it, or whether it is extruded edgewise, the expulsive force consists in uterine contraction. The sooner such contraction sets in after the birth of the child the better; and, if it does not arise spontaneously, it should be provoked by art, for there can be no assurance of safety until the uterus is wholly relieved of its contents. Any accumulation of blood behind the placenta, far from constituting the chief element in the normal process of separation, is always pathological, and often dangerous. The membranes are no more likely to be torn and portions left in the uterus when the placenta is expressed than when its expulsion is brought about in any other way. The author then raises the question whether the retention of shreds of chorion is so much to be dreaded as Dohrn and Runge consider it. He thinks not; and he expressly states that he never attempts to remove such pieces of retained membrane unless they are easily reached and capable of removal by gentle traction. On no account does he think it justifiable to introduce the hand for the purpose of removing them, but resorts to frictions of the uterus, the administration of ergot, and frequent vaginal injections for purposes of disinfection and to render the contractions more energetic. Under such treatment he has seen no more formidable complications than offensiveness of the lochia, occasionally accompanied by slight elevation of the temperature and increased frequency of the pulse. In the last two thousand births at the Leipsic Lying-in Institute there was retention of the whole chorion in eighteen cases, and of portions of it in seventy-eight cases. In ninety-one of these ninety-six instances the retained membranes were not interfered with; in five the whole secundines were removed artificially by the vagina. Of the ninety-one patients, eighty-one were discharged perfectly restored on the twelfth day; ten had to stay longer in the institution on account of various complications, mostly injuries to the internal or external genitals, and none of them directly if at all connected with the retention of the membranes. Of the eighty-one patients, forty-two had slight fever, but in no instance was it severe or accompanied with any signs of infection. The symptoms always subsided when the retained portions of membrane were expelled. Inasmuch as slight injuries of the mucous membrane were present in many of these cases, it can not be stated positively that the symptoms were not due to them. Moderate chills occurred in several instances, and hæmorrhage was noted in seven cases, but never to a dangerous extent. These, Credé thinks, should not be ascribed to the retention of membrane, but to insufficient contraction of the uterus or the loosening of a clot. None of the patients were seriously sick, none were infected, and, as a matter of course, none died. Of the eighteen cases in which the whole chorion was retained, in one case it was removed by Credé's assistants, without his knowledge, and without any cogent reason. The patient had no fever, and was discharged on the eleventh day. All the seventeen others, in whom the retained chorion was not disturbed, likewise did well; sixteen of them were discharged on the eleventh day, and one remained until the sixteenth day. In the whole two thousand cases, the average time that elapsed between the expulsion of the child and that of the placenta was four minutes and a half; in eighty-seven cases there was a delay of more than ten minutes, owing to various circumstances. In five cases the placenta, being partially adherent but easily separable, was removed, together with the membranes, by the introduction of the hand, on account of the occurrence of severe hæmorrhage from uterine inertia, external manipulation not producing satisfactory contractions. In fifteen other cases the placenta, already lying loose in the vagina, was removed with the hand on account of hæmorrhage from lacerations of the cervix or the vagina. In one case the placenta, although detached, was partly grasped by the cervix, from which it was easily removed with the hand. In many of these twenty-one cases expression would have succeeded, Credé thinks, had it not been intrusted to students or inexperienced assistants. In no instance has any evil resulted from its performance in an experience of more than thirty years. ═══ Dohrn, in reply, remarks that, for his part, he obtained his knowledge of the technics of expression of the placenta at Credé's own clinic, and suggests that it is unbecoming in Credé to assume that such men as Runge, Kehrer, and Freund need to be told anew what they learned in all its details many years ago. Nor, he adds, does the charge fairly lie, that their unfavorable results have been due to their misconstruing or modifying the manipulation; for, during many years, they practiced the method precisely as it was taught by its author, and were driven to the modification by experience. The change really consists only in postponing the procedure for a short time after the expulsion of the child. In Dohrn's own opinion, it should be deferred until the greater portion of the placenta can be felt lying in the cervix. As regards the mechanism of the natural expulsion of the placenta, his own experience is, that the process described by Schultze is the more common; but whether or not this is generally the case can be determined only by further observation. Meantime the criticism is offered that Duncan's representation of the uterus at this time as a narrow cylindrical bag is probably incorrect, as Voegtli gives its dimensions as 16 centimetres long and 12·5 centimetres broad (the latter measurement being made during contraction). Credé's statement, that it is only with the third or fourth contraction that the placenta is generally expelled when his manipulation is employed, scarcely tallies with his statistics, which give the average lapse of time as four minutes and a half between the expulsion of the child and that of the placenta. So long as the relations between the human uterus and the placenta remain what they are, it may be doubted if a labor wholly unaccompanied by loss of blood can occur, and it is equally questionable if such a state of things would be desirable—if the mass of blood that has gorged the uterus for so long a time may safely be thrown back into the mother's general circulation. Of course, it is best that the bleeding should not go beyond a certain limit, and it is precisely to avoid such excess that the author defers the execution of Credé's manipulation. The connection between such postponement and the avoidance of excessive hæmorrhage is shown by experience, and particularly so by the following table:

RESULTS.	TIME BETWEEN EXPULSION OF CHILD AND EXPRESSION OF PLACENTA (100 CASES IN EACH CATEGORY).			
	1–5 Minutes.	5–10 Minutes.	10–15 Minutes.	15–30 Minutes.
Flooding	14 cases.	3 cases.	4 cases.	4 cases.
Laceration and retention of membranes	8 "	2 "	1 case.	1 case.
Putrid lochia	18 "	3 "	2 cases.	5 cases.
Putrid lochia and fever	12 "	3 "	1 case.	3 "

In the absence of any manipulation, bleeding is not very likely to occur. In literature it is seldom mentioned as taking place under such circumstances. This, however, does not prove that no watch should be kept over the uterus. Retention of the membranes, he admits, generally does no harm, and, as a rule, it is better to let them alone than to try to remove them. But such favorable results do not always take place. It is, therefore, best to refrain from measures that favor retention—including a too early resort to Credé's manipulation. As to Credé's assertion that the membranes are torn into fragments long before the third stage of labor arrives, Dohrn would like to know how

Credé ascertained the fact. Portions of membrane that come into view before the emergence of the head generally belong to the amnion, whereas it is the chorion that is of practical importance, and lacerations of the latter can scarcely be recognized until the placenta has been expelled into the vagina.

46. In Halbertsma's article on a *method of ascertaining the situation of the placenta in the Cæsarean operation*, he alludes to a previous communication of his ("Centralblatt für Gynäkologie," 1881, p. 67), in which he announced his discovery that in such cases the implantation of the placenta might be mapped out by means of exploratory punctures with a hollow needle. The operator is thus enabled to avoid the placental insertion in cutting into the uterus, and thereby decidedly lessen the risk to both mother and child. When the needle penetrates through the uterine wall elsewhere than within the area to which the placenta is attached, liquor amnii will escape, whereas, if the needle enters the placenta, nothing but blood will flow. Moreover, it may be advantageous to draw off the liquor amnii in this way before incising the uterus, for the uterus will then contract, less blood will be lost when it is opened, and its permanent contraction after the operation will be favored. Besides, if the liquor amnii has begun to putrefy, its escape into the peritoneal cavity may thus be avoided. The author thinks that this reduction in the size of the uterus is likely to be of special advantage in Porro's operation, for it will lessen the length to which it will be necessary to carry the incision through the abdominal wall.

48. Dr. Breus showed a patient upon whom Professor G. Braun had performed *Porro's operation.* The uterus was incised before its removal from the abdomen, but neither blood nor liquor amnii escaped into the abdominal cavity. The stump was seared with a Paquelin's cautery, and stitched to the abdominal wall.

62, 63, 64, 65. [For an exposition of the subject of *ophthalmia neonatorum*, embracing a consideration of these papers and others, the reader is referred to Dr. Bull's "special article" in this number of the "Journal."]

GYNÆCOLOGY.

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3. Dr. Wiltshire enumerates the leading causes of *pruritus vulvæ*, and traces their modes of action. It is suggestive, he remarks, that nearly all the local applications that give relief are parasiticides, and his own experience favors Friedreich's view that the pruritus is due to the development of fungous organisms. Unless contraindicated, it is well to begin treatment with a simple borax wash (gr. xij to the ounce; often stronger, seldom weaker). A hydrocyanic-acid lotion (ʒ j of the dilute acid to ℥ x of water), a two-grain solution of morphia, or a half-grain solution of atropia, aconitia, or veratria may be used to advantage. Infusion of tobacco (℥ ss to the pint) relieves alone in some cases, and is a good vehicle for borax or boracic acid. Glycerine, from its affinity for water, is apt to aggravate the irritation. Chloral lotions sometimes give relief, but do not always suit. Ice alone will relieve some, while others can get relief only from the use of very hot water. In excessively severe cases, ether spray might be tried. Fatty applications do not usually answer so well as lotions. Only non-rancid fats should be used. Lotions of iodine occasionally answer (ʒ ij of [? tincture of] iodine in ℥ x of elder-flower water). Electricity may afford relief in neurosal cases, faradization being probably the preferable form. In simple inflammation of the vulva, lead, borax, or carbolic lotions relieve, or an ointment of calomel or bismuth. In cases of malignant disease, if ablation is impracticable, sedatives, such as conium, opium, or belladonna, are often all that can be employed. Urticarial itching is mostly seen in association with ovarian tumors; a lotion of bicarbonate of sodium, or of borax with hydrocyanic acid, generally relieves. Dusting freely with fine oxide of zinc answers well when ichorous weeping is abundant. For fissure, a poultice formed of the clot resulting from the addition of ʒ ij of liquor plumbi to ℥ x of fresh milk is most useful. Mercurial ointment suits certain cases. Angry ecthymatous spots appear to yield only to calomel, dry, or in the form of an ointment, or of black wash. Opium is a valuable adjunct, both internally and externally. In the insomnia of diabetic pruritus vulvæ, one-grain doses of codeia, in pill form, sometimes produce gratifying results, and the bromides also are useful as hypnotics. When, in the latter months of pregnancy, there is aphthous ulceration, with the presence of oïdium albicans, nothing relieves more quickly than a lotion of sulphurous acid — a tablespoonful of the officinal solution mixed (for each occasion) with half a pint of warm water, barley water, or almond emulsion. A solution of bicarbonate of potassium (gr. xv : ℥ j) is a very useful lotion, and should also be injected into the vagina; it checks the discharge, often alkaline, which seems to excite irritation. Arsenic is indicated in the neurosal forms, especially when there is marked loss of flesh. The author has found it most beneficial in the subjects of leucoderma. Chloroform, in the form of vapor, liniment, ointment, or lotion, occasionally answers. Corrosive sublimate (gr. j–v : ℥ viij of mistura amygdalæ) may afford great relief, but it requires caution in its use. In intractable cases frequent changes of remedies are inevitable.

4. Spillmann's article on *gangrene of the female genitals in typhoid fever* is largely clinical in its scope, giving full details of a number of interesting cases. He sums up his conclusions as follows: 1. Although rare, the affection constitutes one of the gravest of the complications of typhoid fever. 2. At its onset it may take the form of a simple œdema, of an inflammation of the vulvo-vaginal glands, or of small superficial eschars limited to the labia majora or the nymphæ. 3. In severe cases the gangrene takes the humid form, extends over the whole vulva, and may even invade the vagina, the thighs, and the trunk. Under such circumstances it often terminates with symptoms of gangrenous infection. 4. The gangrene may be limited to the vagina. It then often passes unrecognized, and may afterward give rise to stenosis of the vagina and retention of the menses. 5. Gangrene of the vulva is sometimes the result of a true local infection, through erosions or ulcerations of the vulva or the excretory ducts of the vulvo-vaginal glands. 6. Syphilitic lesions of the vulva seem to be readily transformed into gangrenous foci in patients with typhoid fever. 7. Gangrene of the vulva is always a serious complication; death ensues in two thirds of the severe cases. 8. The possibility of the complication should always be borne in mind, and attention should be given to the cleanliness of the parts in all women suffering with typhoid fever. In the adynamic forms they should be minutely cleansed every day. As soon as the gangrenous affection shows itself, local antiseptic treatment should be begun. A careful watch should be kept over the process of cicatrization.

14. In this paper on *congestive dysmenorrhœa*, Dr. Herman quotes various standard authors to show the looseness with which the term is used, and the meager information conveyed by it. The only way, he thinks, in which the term can be made useful clinically, is either by restricting it to cases in which there is reason to think that congestion, or a slight degree of inflammation, is the sole or chief morbid condition present; or at least by drawing a distinction, as the French do, between cases in which the congestion is a part of some definite disease of the pelvic organs, the menstrual pain being an exaggeration of the symptoms of that disease (symptomatic), and those in which the dysmenorrhœa, presumed to be due to congestion, is the patient's only trouble (idiopathic). He then restricts himself to the consideration of this latter form, which he thinks it would be well to designate as "primary congestive dysmenorrhœa." Cases of this sort are rare, but they certainly are met with. Of course congestion never arises without a cause, but the cause may be transitory, while the resulting changes may be of longer duration, so that we may be able to discover the latter only, or the cause may be so insignificant that it escapes detection. To prove that the pain is due solely to congestion, no other cause should be discoverable, and it should be relieved by depletion of the overfilled vessels. Furthermore, if the cause of the congestion has ceased to act, sufficient local blood-letting should cure the patient. In such cases the patient remains florid in the face, her mucous membranes continue highly colored, and her general appearance is so much that of health that it ought to suggest at once to the observer that the cause of the trouble is probably local and not constitutional. With a decrease in the quantity of the menstrual flow (without any such change in the patient's general condition as usually lessens the amount of the flow) there is an increase of the accompanying pain. It is not very intense, nor is it paroxysmal, although there may be remissions in its severity. It is not definitely localized, but is described as a constant dragging, aching, throbbing, or "gathering" pain, vaguely indicated as around the lower part of the back and abdomen, and down the thighs. It is relieved, but not wholly removed, by lying down. It precedes the flow by a day or more, accompanies it, and may last a day or two after it. There is usually a too frequent desire to make water, and there is slight pain during micturition. Whether other pains are present or not will depend upon the degree of congestion, and so will the severity of the pain and its duration; it may be continuous from one menstruation to the next. The chief diagnostic marks are: (1) diminution in the quantity of the flow, without anything in the general condition to account for it, and (2) increase of pain, with no definite local disease to give rise to it. The author believes, with Barnes, that the affection is more common in women who have borne children than in others, and that it may be produced by cold, or by physical or emotional shock, such as fatigue, fright, anger, etc., but he refrains from discussing the influence of venous congestion from heart, lung, or liver disease. Local depletion is the remedy, either by leeches or by scarification, the former being the more effectual,

although slightly the more troublesome. Everything tending to cause portal congestion should be removed. Therefore moderate purgation is desirable, preferably with salines. The advisability of ordering complete rest is doubtful; moderate exercise does not aggravate the local symptoms, and is good for the general health, but over-fatigue and prolonged standing should be avoided. Alcoholic drinks and heavy meals should be forbidden. Local depletion is not essential in every case, although it is the most effectual, speedy, and certain remedy. In mild cases aperients and attention to hygiene may suffice. The longer the morbid condition has persisted, the more protracted will the course of treatment need to be. Even in the most chronic cases temporary relief may be secured by taking blood from the uterus. This form of congestive dysmenorrhœa often coexists with other morbid conditions; hence, as a general rule, the cases of uterine disease in which local depletion does good are those which are associated with this kind of congestive pain.

19. In Chrobak's paper on *the treatment of endometritis* he restricts himself to the simple catarrhal form of the affection, and emphasizes a symptom that he considers diagnostic of corporeal endometritis—namely, the occurrence of a sudden gush of pent-up secretion from the uterus, followed at once by signal relief to the reflex symptoms. This occurrence not only explains "intermenstrual pain," but is for the author the keynote to treatment. The first indication is to dilate the uterine canal, both to secure the free outflow of the secretions and to admit of the ready application of medicaments to the endometrium, which latter are best applied in the form of solutions. With due precautions, he thinks intra-uterine injections are practically free from danger. They should not be of a character to give rise to firm clots within the uterus.

26. M. Le Bec's paper on *the anatomy and pathology of the broad ligaments* reflects the peculiar views of M. Alphonse Guérin, according to whom but the very slightest amount of cellular tissue exists in the space between the layers of the broad ligament, which space is really formed into a closed cavity by an aponeurotic lamina derived from the fascia propria, which hermetically seals the space at its bottom. The capacity of this cavity, when distended by an injection, is about equal to the bulk of an almond. None of the uterine lymphatics enter the broad ligament, but those from the cervix and the vagina pass beneath the aponeurosis above mentioned, while those from the body of the uterus run upon the broad ligament without entering its cavity. The practical bearing of these statements is, that pelvic phlegmon does not arise primarily within the broad ligament, but in the cellular tissue beneath it. Some little pus may be found in the proper cavity, but no bulky collection.

28. M. Courty has often found *pelvic adenitis* in patients who had been under treatment for chronic metritis, and had been pronounced cured, but still continued to suffer. In such cases he has found the pain more localized than it had been during the progress of the metritis, seated more or less deep in the pelvis, on one side rather than both (oftener the right than the left), posteriorly, toward the sacrum or, still oftener, the coccyx; radiating to the rectum and anus, provoked by standing or sitting, by coitus, or by the pressure of the speculum upon the posterior vaginal wall; propagated less to the lumbar region and still less to the epigastrium; and not accompanied by reflex phenomena. On abdomino-vaginal palpation, one or more little rounded bodies may be felt behind the uterus, irregular in shape, varying in size from that of a pea to that of a small nut, and very painful on pressure. On decidedly depressing the tissues with the external hand, a string of these little bodies may not infrequently be discovered stretching out laterally from the uterus. As they are not wholly free from adhesions, they do not elude the grasp like a prolapsed ovary, and, being more rounded and definite in outline than inflammatory indurations of the cellular tissue, they need not be confounded with the latter. The treatment should consist in the use of resolvents—general baths of alkaline solutions, very hot injections, and the topical application of belladonna and mercury. The whole hypogastrium may be covered with an ointment composed of extract of belladonna and mercurial ointment (1 : 20). The author attributes great efficacy also to the following ointment, inserted into the upper part of the rectum by means of a particular instrument that he has devised for the purpose: ℞ Galen's cerate,* mercurial ointment, āā, 15 grammes [about ℥ ss]; Sydenham's laudanum, 10 drops; extract of belladonna, 1 — 5 centigrammes [$\frac{1}{6}-\frac{3}{4}$ grain]. M. These applications are to be made only once or twice a week, and the patient should avoid a movement of the bowels on the following day [which last injunction is certainly a serious drawback to any efficiency that may attend this method of treatment].

32, 33, 34. Mr. Wells presented the particulars of 200 additional cases of *ovariotomy*, making 1,000 in all; 231 of the patients had died, and 769 had recovered; but the percentage of mortality had steadily diminished from 34 in the first 100 to 11 in the last. Since the 888th case, all the operations had been in private practice, and all had been done antiseptically; the result being a mortality of 10·6 per cent. Mr. Wells remarked that for several years he had doubted the necessity of keeping the patient's room so warm as he had done at first, and that for the last two or three years he had kept the room only comfortably warm, and the patient's skin moderately moist. ═══ Dr. Drysdale records a case of unilocular ovarian cyst, the size of which had been greatly reduced by aspiration. He was called upon to perform ovariotomy, and upon making the abdominal section the omentum and intestines protruded at the wound, instead of the smooth, glistening surface of the cyst, which is commonly encountered. The cyst itself had retreated down into the pelvis beneath the intestines, but, being free from adhesions, was drawn out and clamped as usual. The patient made a good recovery. The position of the intestines, by their liability to injury, added considerably to the danger of the operation, and this possibility, although not heretofore described, should be borne in mind in making the primary incision. [The presence of omentum, intestine, etc., between an ovarian cyst and the anterior wall of the abdomen is by no means "undescribed." We would refer the reader to the late Dr. Peaslee's work ("Ovarian Tumors," etc., New York, 1872), pp. 69, 70. The peculiarity of Dr. Drysdale's case would seem to be that the presence of omentum and intestines just beneath the abdominal wall was due not to their having become adherent there before the tumor rose out of the pelvis, but to the fact that the cyst had retreated into the pelvis after the withdrawal of its contents, thus allowing the abdominal organs to resume their normal relations.] ═══ Ahlfeld, in remarks made before the Obstetrical Society of Leipsic, combated Olshausen's idea that it made little difference how the abdominal wound was brought together in cases of laparotomy. The frequency of ventral hernia from insufficiency of the cicatrix was brought up, and a case was alluded to of death from septic peritonitis and pleurisy five weeks after the operation, infection having traveled from the suture tracts between the layers of the abdominal wall. Catgut should not be used for the sutures, the only proper materials being silver wire and silk. The incision should be closed accurately, and the sutures should not be removed before the tenth or twelfth day. After that, antiseptic dressings should be used for several days.

44. In this series of articles on *total extirpation of the uterus*, Dr. Mikulicz, assistant at Billroth's clinic, reviews the subject in a most careful and systematic manner. Is it justifiable, he asks, to discard Freund's operation utterly simply because the results thus far have been so unfortunate? The yearly mortality from all causes among women from twenty-five to eighty years old (the period of life when uterine cancer prevails) has averaged 4,500 in Vienna during the past nine years—from 163 to 223 of these deaths being caused by cancer of the uterus. In view of such statistics, shall surgery wait for somebody to discover an internal remedy against cancer? Early amputation of the cervix has given very good results, but something ought still to be done for patients in whom the disease has so extended as to contraindicate that operation, or has relapsed after its performance. The idea of Freund's operation is by no means new. The possibility of such a procedure was suggested by Soranus near the close of the first century. It was first actually done by Andreas a Cruce, in 1560, but it was not until the present century that scientific precision was attained in the technics of the operation. The so-called hypogastric method (closely resembling Freund's, and brought forward by Gutberlet, in a prize essay, in 1814) was actually carried out by Konrad Martin Langenbeck, in 1825, and afterward by Blundell and others, including Delpech, who brought the subject up for discussion in the Paris Academy. In 1822 Sauter performed the vaginal operation, removing the uterus from its normal situation. The results of both these methods were generally so unfavorable, however, that they soon fell into desuetude, until Freund, by improving the technics in general, and especially by his precise method of peritoneal suture, brought the hypogastric operation to the utmost perfection. In two instances Billroth performed an operation closely resembling Freund's (once before Freund's first publication), but, the results being fatal, while those attained by Czerny with the vaginal method were rather favorable, he has since adopted the latter plan. Of six patients subjected to this operation by him since December, 1879, three have survived. In the other three relapse occurred in from one to three months. All the deaths were due to septic peritonitis. In one of the laparotomies the ureter was injured, and in both of them remnants of the cancer, or at least infected glands, were found after death in the cellular tissue of the pelvis. Were we to be wholly governed by such a record as this, we should have to give up both operations altogether; but, if better results are to be achieved in the future, the question is, which of the two methods is most likely to furnish them. It needs but little reflection to show that the vaginal operation is easier of execution and less prostrating to the patient than that of Freund. The dangers of the latter, enumerated in the order of frequency with which they prove fatal, are: (1) septic peritonitis and phlegmonous pelvic inflammation, (2) shock, (3) hæmorrhage, (4) injuries of the ureters and the bladder. One of these—shock—is practically done away with in the vaginal operation, and the others are easily avoided. Moreover, the vaginal method seems *a priori* to offer greater facilities for a thorough removal of the cancerous deposit, thus lessening the liability to relapse. In Freund's method it is only the healthy part of the organ that we have in full view, and we are forced to work in the dark about the cervix, whereas in the vaginal operation it is particularly the degenerated cervix and its surroundings that are accessible, so that the extent of the diseased tissue is more readily recognized. Freund's operation is indicated, therefore, only in the rare cases of cancer of the fundus, and even then Schröder prefers his supra-vaginal amputation. [At this point the author elaborates the germ theory in such a manner as to account, he thinks, for the greater liability to septic infection after extirpation of the uterus than after ovariotomy and the like, referring the reader for further information to two other articles of his ("Zur Sprayfrage," in von Langenbeck's "Archiv," xxv; and "Ueber die Anwendung der Antiseptik bei Laparotomien, mit besonderer Rücksicht auf die Drainage der Peritonealhöhle," *ibid.*, xxvi).] Practically, drainage of the peritoneal cavity is not only almost always useless, but often very dangerous. The best safeguard against septic peritonitis lies in the complete closure of the peritoneal wound, *turning the traumatic surfaces out into the vagina*, as may readily be done by the vaginal method of operating. During the whole operation the vagina should be irrigated with a two- or three-per-cent solution of carbolic acid. This not only washes away all infective masses at once, but, by keeping the wound free from blood, does away with the need of using sponges. Still further to guard against infection, the operation should be done in two separate acts. The first comprises the separation of the cervix from the vaginal mucous membrane and the cellular tissue of the pelvis, and the complete removal of the fetid neoplasm. The whole wound is now to be disinfected with a five-per-cent solution of carbolic acid; the operator and his assistants disinfect their hands anew; and the instruments that have been used thus far are exchanged for fresh ones. The second part of the operation is now performed—the opening of the peritonæum, etc. Another way of avoiding peritoneal infection consists in removing the broken-down portion of the neoplasm with a scoop several days before the operation, and cauterizing the scraped surface with chloride of zinc. It may not be possible to do this thoroughly, however, and, moreover, it is not altogether free from danger, since of itself it may give rise to pelvic phlegmon and even septic peritonitis. The bleeding caused by it, too, may lessen the patient's chances, and the absence of the vaginal portion of the cervix may prove a source of technical difficulty when the operation comes to be done. There is but one measure capable of preventing the infection from the stumps of the broad ligaments that chiefly leads to pelvic phlegmon, and that is continuous irrigation. [A particular apparatus for the purpose is figured and warmly recommended.] A solution of thymol (1 : 100), of salicylic acid (1 : 300), or of boracic acid (4 : 100) will answer. Carbolic acid should be avoided on account of the danger from its continuous absorption. The continuous irrigation should be kept up for about eight days, and at the end of that time the irrigator may give place to a simple fenestrated drainage tube, through which the vagina should be washed out three times a day with a three-per-cent. solution of carbolic acid. The author gives a full description of the technics of the vaginal operation, and concludes his essay with a consideration of what is necessary to be done to put cancer of the uterus on a par with cancer in other accessible parts as regards curability by extirpation. It may well be questioned, he thinks, if we have not hitherto treated the rectum, the ureters, and the bladder too much as a *noli me tangere;* and he suggests that the methodical removal of more or less of these structures might be so managed as not to add materially to the dangers of hysterectomy, while materially insuring the entire eradication of the neoplasm, and consequently lessening the chances of a relapse. In an appendix he records a successful case of removal of the uterus per vaginam by Billroth.

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* Galen's cerate [*cérat de Galien*, or *cérat blanc*] is composed of 1 part of white wax dissolved in 4 parts of oil of sweet almonds and stirred constantly, adding gradually, as it cools, 3 parts of water or rose water. The mixture is then poured into a warmed marble mortar, and triturated until it is quite cool.

50. Credé's case of *nephrectomy for uretero-uterine fistula* presented some interesting peculiarities. He states that it is the fourth instance of removal of the kidney on account of urinary fistula. After dilating the cervical canal with a sponge tent, so as to admit a small speculum, a little triangular depression was found on the right side of the uppermost part of the cervical canal, and from this opening it was manifest that the urine escaped. The remains of a parametritis were found on the right side of the uterus. The most careful attempts to explore the ureter failed. About 600 grammes of normal urine escaped daily from the fistula, and 500 grammes from the bladder. The bladder was evidently intact, for its function was performed perfectly, and its contents could be retained until it could be felt to be over-distended. There was, then, no doubt that the fistula was uretero-uterine, but the question was, which ureter was implicated. It was thought possible that the left one had become so diverted from its normal course as to come in relation with the right side of the uterus. This was considered improbable, however, and confidence enough was felt in this conviction for the author to feel warranted in removing the right kidney instead of the left. [As a rule, he considers nephrectomy preferable in such cases to the formation of a vesico-vaginal fistula, with subsequent closure of the vaginal outlet—provided there is reason to believe the other kidney sound.] His intention was, nevertheless, to submit the question to a still further test, namely, that of opening the pelvis of the kidney, and injecting fluid into the ureter. At the operation, however, it was found so difficult to reach the pelvis of the organ that the kidney was removed entire. No urine was afterward discharged from the vagina, and the patient made a perfect recovery. Added to those collected by Kroner ("Arch. f. Gynäk.," xvii, 1), this case makes forty-two complete nephrectomies—twenty-one by the abdominal incision, with fourteen deaths, and twenty-one by the lumbar incision, with five deaths. Of the lumbar operations four were done for urinary fistulæ, without any deaths. Unmistakable evidence of interstitial nephritis was found in the kidney removed by Credé, and seems to have decided him to remove it without the final test he had proposed. This is an interesting point, from the fact that careful examination disclosed no abnormality of the urine. In the operation, the incision was made about two centimetres farther from the median line than in Simon's method, thus avoiding injury to the sacro-lumbalis muscle and the last intercostal and first lumbar nerves, and doing away with the necessity of turning the quadratus lumborum aside.

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7. Thomson's *instrument for the detection of color-blindness* consists of two flat sticks, about two feet in length and one inch in width, fastened by a hinge at one end and connected together by a button at the other. Between these, and concealed from view, are forty white buttons, having the figures from 1 to 40 engraved upon them, attached to the stick by small wire hooks. To the eyes of these buttons are attached forty skeins of colored wool. The test-skeins are three: light-green, rose or purple, and red. These skeins are shown to the persons examined in turn, and they are directed to select from the stick the colors which will match them. On the stick the colors are arranged alternately to match the tests, and to be of those confusion-tints which experience shows to be most commonly selected by the color-blind.

15. Just contributes a short article to the *statistics of myopia*, the result of an examination of the eyes of 1,229 scholars in the two high schools of Zittau, in both of which the hygienic conditions of light, space, and arrangements of furniture leave nothing to be desired. He found that myopia was as frequent in the new schools of Zittau as in other educational institutions of the same kind, and hence he concludes that it does not chiefly result from insufficient illumination of the school-rooms, but rather from the great and ever-increasing demands on the industry of the pupils at home, forcing prolonged labor on their eyes during the evening hours, frequently by insufficient artificial light.

26. Nicati describes a case of what he calls true *distichiasis*, in which the hairs grew from the ducts of the Meibomian glands. The case was a very complete one, the rows of hairs extending from one end of all four lids to the other, and emerging regularly from the orifices of the ducts of the Meibomian glands. From a pathogenetic standpoint, the presence of these hairs is another proof that these glands partake of the nature of sebaceous follicles. The radical treatment would be by the galvanic-cautery needle or excision. He recommends the following operation: he makes a vertical incision with a cataract-knife throughout the whole length of the lid, immediately behind the faulty cilia and parallel to the conjunctiva, so as to detach the tarsus from the conjunctiva, which incision should be two millimetres deep. Parallel to this, but immediately in front of the cilia, he makes a second incision of the same length and depth. Then with scissors he extirpates this circumscribed portion with the hairs.

29. Wolfe has a short paper upon his new method of performing *plastic operations upon the eyelids*. He defines his operation as one distinct from the skin-grafting process of Reverdin, and from that known as cuticle-scraping. It consists in the transference of skin flaps, cut to shape from any part of the patient's body to supply deficiencies elsewhere. His dressing consists of dry lint, though he thinks Martin's recommendation of hot dressing a decided improvement; and he has also gradually been reconciled to the use of very fine sutures. He does not employ antiseptic dressing, because he considers it desirable to keep the cuticle from peeling off, and thinks the carbolized applications have a tendency to lead to its detachment.

30, 31. Mathewson reports two cases of *ectropion treated successfully by Wolfe's method of transplantation of skin flaps without pedicle.* In the first case, operated upon by himself, the transported skin flap was taken from the left side over the seventh rib, was elliptical in shape, and measured three inches in length by one and a half in breadth. In the second case, the flap was removed from the inner surface of the upper arm, and measured 2·6 inches in length by 1·7 in breadth. ═══ Dr. Howe also reports a successful case. The patient was a young woman who had complete eversion of the right upper lid and dense cicatrization of the skin of the forehead, the result of a burn in childhood. The piece of skin was taken from the inner aspect of the right forearm, and measured 3⅛ inches in length by 1⅜ in breadth. Three months later the effect was excellent, though the movements of the lid were, of course, restricted.

40. Raehlmann's paper upon *amyloid degeneration of the conjunctiva* is based mainly upon two cases of his own. Both of these cases showed that amyloid degeneration here is entirely independent of conjunctival trachoma. Both also showed the possibility of a retrograde metamorphosis of the amyloid degeneration after partial extirpation. Raehlmann thinks that real amyloid formation in the conjunctiva is always preceded by a stage of hyaline degeneration; that amyloid formation in tumors must always be regarded as something accidental, for it only appears in the advanced stages of neoplastic formation, and then generally secondarily; and, finally, that the tumors here under consideration are entirely independent of trachoma both in their origin and in their course. They may degenerate and entirely disappear after partial extirpation. Their structure resembles that of lymphoid tumors. They may undergo hyaline degeneration throughout a greater or less extent without any amyloid substance being demonstrable in their structure.

41. Rampoldi reports a very *singular circulatory phenomenon in the cornea*, of idiopathic origin. The patient was a girl æt. 17, who was first seen in October, 1880. She had always been perfectly healthy, except for an attack of typhoid fever in 1879. A few days before she applied for help she noticed that whenever she bent her head over her work the left eye gradually became clouded, as if there were a white veil before it, which condition disappeared in a few minutes after her head was raised. The difficulty of vision returned with every prolonged inclination of the head. An examination in the upright position of the head showed slight protrusion of the left eye, with, however, no limitation of motion; slight chemosis of the ocular conjunctiva downward, but nothing abnormal in the cornea. After her head had been inclined for twenty minutes, vision became obscured, and an examination then showed a milk-white spot at the center of the cornea, located in the anterior layers, of about the size of the pupil. Gradually, as the head remained erect, this faded away, demonstrating that the cloudiness was in the lymphatic channels; and it faded away toward the subconjunctival lymphatic space. After a month's duration the phenomenon ceased to appear.

51. Galezowski recommends *synechotomy for adherent leucoma.* He has employed this operation in cases of more or less limited anterior synechiæ of traumatic origin; in cases of anterior synechiæ developed in consequence of an operation for keratoconus; and in cases of partial adherent staphyloma of the cornea. He makes use of a needle with a cutting edge, shaped like a pruning-knife, or of a short synechotome made for the purpose. He punctures the cornea at the side opposite to the synechia, and a little above the horizontal diameter of the leucoma, directing the point of the instrument between the iris and the cornea, with the edge toward the synechia. Then, by repeated saw-like movements, the iris is cut loose from the cornea. By thus detaching the iris from the cornea, it is believed that glaucomatous accidents are prevented, and at the same time the staphyloma and the astigmatism are cured.

53. In his paper upon *the neuropathological significance of the width of the pupil*, Raehlmann considers his subject under three heads: I, The reaction to light; II, Reaction to movements of convergence; III, Reaction to conditions of innervation of the sympathetic. 1st. If the illuminated pupil does not react to light, while the other pupil does, though not illuminated, the first optic nerve still retains its conducting power, and the failure of the pupil to react is due to unilateral paralysis of the pupillary branch of the corresponding oculo-motorius, or to some affection of the iris. 2d. If the pupils react to light, in spite of complete blindness, the cause of the latter is beyond the corpora quadrigemina. 3d. If both pupils react during convergence, both motor oculi nerves perform their function as regards the pupil. 4th. If both pupils fail to react to light, either directly or sympathetically, while they contract during the act of convergence, and if there is a certain amount of vision in one or both eyes, there is some obstruction to conduction in the fibers between the nucleus of the oculo-motorius and the tubercula quadrigemina. 5th. In physically weak, nervous persons and in maniacal patients, very wide pupils are so often observed that narrow pupils are regarded as an ominous symptom of approaching paralysis. A rhythmical change in the pupils is also observed in these cases, independent of the influx of light or of the act of convergence. 6th. Narrow pupils are peculiar to all diseases which cause a diminution of the cortical function, especially paralytic dementia. 7th. Myosis is especially frequent in diseases of the spinal cord and medulla oblongata: in tabes the narrow pupil is immovable to light, but reacts to the act of convergence. 8th. Irritation of the sympathetic in its peripheral course, or of its cervical ganglion, causes dilatation of the pupil. 9th. Dilated pupils are a very characteristic symptom of impeded respiration from the action of carbonic acid upon the medulla. Contraction of the pupil shows that the highest degree of narcosis has been reached. 10th. The pupils are dilated in pressure upon the brain, in brain tumors with choked disk, in chronic hydrocephalus, in hæmorrhages within the cavity of the skull, and in simple distention of the cerebral vessels. 11th. Difference in the size of the normally movable pupils points to an irregular innervation of the sympathetic, due to an irritation either in its peripheral course or in the central connections in the brain and spinal cord. Mydriasis of one eye, with movable pupil, is a suspicious symptom, pointing to threatening brain disease, while, without a movable pupil, it has no special significance.

55. Rüter reports at great length a case of *tuberculosis of the iris* in a child, and then proceeds to discuss the whole subject of tuberculosis of the eye. The child was two years old, and the mother had noticed a gray spot in the pupil three weeks before Rüter saw him. An attempt was made to remove the mass, which filled the external half of the anterior chamber, by the ordinary operation of iridectomy. This, however, proved unsuccessful, and, as a granulating mass began to grow from the scleral wound, the eye was enucleated. Two months later the child had a violent attack of convulsions with left hemiplegia. A careful macroscopical and microscopical examination of the enucleated eye demonstrated a tuberculosis of the iris, which had begun in the form of nodules, and had gradually led to tubercular infiltration of the entire iris and also of the sclero-corneal wound. There were also found all the signs of cyclitis, anterior and posterior synechiæ and partial opacity of the lens. There was no demonstrable pathological change in any other part of the eye.

58. Guaita gives a very careful etiological and histological description of a so-called *cyst of the iris*, of spontaneous origin and obscure pathogenesis. The cyst was closed anteriorly by the corneal endothelium. These cysts might better be called cysts of the anterior chamber, since in reality the essential part of the cyst-wall was composed of the endothelium of the chamber, and of its basement membrane. The endothelium of the iris *only* was involved. The more probable view of the pathogenesis of these cases is that it is due to a congenital alteration. Probably the anterior surface of the pupillary membrane, and the posterior surface of the cornea, which at first are in contact, become in these cases adherent, so as to circumscribe a sort of cavity, limited behind by the pupillary membrane and iris, in front by the posterior surface of the cornea, and on the sides by the adhesions. In this pocket is contained the liquid arising from the degeneration of the endothelial cells, which, as time goes on, distends the cyst-wall, and the cyst grows larger.

59, 60. Giraud-Teulon's first paper is properly a report made to the Surgical Society of Paris upon a paper of Masse's upon *cysts of the iris*. The reporter concludes that, besides dermoid cysts, wo sorts of cysts occur in the iris: the one serous, translucent, with thin walls and transparent contents, and relatively of large size; the other appearing under the form of bead-like globules, like mother-of-pearl, smaller than the preceding, formed of concentric layers, veritable strata of epithelial or epidermal cells, mingled with fat globules and crystals of cholesterine. In the majority of cases the latter originate from a penetrating wound of the cornea. As to the former variety, the real serous cysts, they must be regarded as neoplasms growing by heterotopia; though there is a chance here for both methods of production, for the spontaneous production of a serous cyst formed at the expense of the zonular elements or of the connective tissue of the stroma of the iris, and for the formation of a cyst by the introduction of conjunctival elements. Here let it be remembered how often small corneal cicatrices escape observation, especially when situated in the limbus. ═══ In his second paper Giraud-Teulon divides cysts of the iris into three classes, viz.: 1st, Cysts with an internal epithelial wall and serous contents; 2d, Dermoid cysts, sometimes containing fine hairs; 3d, White or pearly cysts, which, however, properly speaking, are not cysts but tumors of the structure of the pearly epithelioma. Iris cysts are generally of traumatic origin, and result from the introduction into the anterior chamber of a small quantity of conjunctival epithelium, which becomes attached to the iris, and gives rise to the tumor.

66. Knapp's conclusions as to *sclerotomy in glaucoma* are as follows: 1st. Sclerotomy is to be preferred to iridectomy in cases of simple chronic glaucoma with narrow field and deep excavation. 2d. Sclerotomy *only* should be done in cases of congenital buphthalmus. 3d. Sclerotomy should be preferred to iridectomy in glaucoma of young persons, and in cases of hæmorrhagic glaucoma. He also considers it legitimate to try sclerotomy in acute glaucoma.

73. In a somewhat brief paper on *hemeralopia in diseases of the liver*, Parinaud draws the following conclusions: 1st. Hemeralopia is by no means a rare complication in diseases of the liver. 2d. It appears ordinarily in attacks of varying duration. 3d. It appears in chronic affections, notably in cirrhosis, and develops after the liver has been affected for some time. 4th. It does not seem to be produced by icterus, but by a special alteration of the blood resulting from interference with the hepatic functions. 5th. It is of grave significance.

77. Heyl's paper on *intra-ocular lipæmia* is interesting, though his conclusions must still be regarded as hypothetical. After a preliminary account of lipæmia as a physiological and as a pathological phenomenon, and of the two forms of lipæmia, he reports a case in which he was fortunate enough to be able to make a careful ophthalmoscopic examination. The patient was a man, aged twenty, in whom the chief ophthalmoscopic appearance was an abnormal color of the blood-vessels of the retina, the blood in both arteries and veins being of a light salmon color. The caliber of the vessels was also apparently increased, and the fundus appeared very light. He calls this intra-ocular lipæmia, and proceeds to differentiate it from intra-ocular leucæmia. In leucæmia the color of the fundus is an orange-yellow, while in lipæmia it is of a light salmon-red color. In leucæmia the veins are pale, of a bluish-red, while the arteries are of a pale yellow. In lipæmia arteries can scarcely be distinguished from veins, and both have nearly the same color as the fundus. In lipæmia the retinal vessels are apparently of about double the size of those of a normal eye, and this Heyl thinks is due to the presence of the molecular fat in the plasma of the blood, thus causing the full width of the vessel to appear. In leucæmia all agree that the veins appear unusually large and the arteries very narrow. [Heyl's explanation of the apparent size of the retinal vessels will not be accepted by all.] With regard to the pathological effect of intra-ocular lipæmia of the molecular form, as manifested in diabetes mellitus, Heyl calls attention to the fact that the extra-ocular complications in this disease are all characterized by necrosis of tissue. This necrosis of tissue is probably the result of interrupted circulation, and, Heyl thinks, may be caused by occluding masses of fat. He concludes that there is a strong presumption in favor of fatty obstructing masses in the intra-ocular blood-vessels as a cause of diabetic cataract, provided, as he says, there exists reasonable ground for supposing that such a cause would produce cataract at all.

78. Bresgen reports a case of *diabetic amblyopia* without any ophthalmoscopic sign. The characteristic symptom was the appearance of a pericentric scotoma, within the limits of which the form-sense or perception was at first diminished, with, at the same time, partial diminution of the color-sense, which afterward became total, and, finally, diminution of the light-perception, while the peripheral parts of the retina performed their normal functions unimpaired. The case resembled the ordinary cases of alcoholic and tobacco amblyopia, at least from a pathological standpoint.

84. Hughlings-Jackson's paper upon *optic neuritis in intra-cranial disease* is very long, and of exceptional interest. The frequent putting of questions for the purpose of eliciting subsequent discussion makes it almost impossible to give a fair idea of its scope in an abstract. He thinks there is but one kind of optic neuritis from intra-cranial disease. Considering it ophthalmoscopically, the most trustworthy localizing symptoms helping the diagnosis of tumor are such as convulsions beginning unilaterally, and paralyses of cranial nerves. He doubts whether he has ever seen double optic neuritis from clot, though he has seen the two coincidently. In tubercular meningitis he believes that swelling of the disk comes on at a time when the diagnosis of meningitis is made from other evidence; it is slight, even, and merges into the fundus, like the earliest stage of optic neuritis from intra-cranial tumor. But he also admits the clinical difficulty, that intra-cranial tumor sometimes produces an acute illness, not distinguishable by its symptoms from meningitis, tubercular or traumatic. He does not recognize any difference in the kind of disk between cases in which sight is good and those in which it is defective or lost, but only a difference in the *stage* of changes. He recognizes the difficulty of determining whether a patient has *had* neuritis from the appearance of the disks at a later period, especially if the patient has never been seen before. He calls attention to the fact that, in some cases of atrophy from neuritis, the pupils do not contract under the stimulus of light, while they do during the act of accommodation. When the author comes to speak of clinical facts, he expresses his conviction that the diagnostic value of optic neuritis is not dependent upon whether the sight be good or lost. He thinks that there is nearly always a stage of neuritis before sight fails, though he admits that sometimes vision is affected before there is any ophthalmoscopic evidence of neuritis. In regard to the association of optic neuritis with other symptoms, he classes neuritis, headache, and vomiting in one group. The three symptoms depend in very many cases on local gross organic disease within the cranium, but are no further localizing; they do not help us to determine in what particular part within the cranium the inferred disease is. It is, however, important to bear in mind that optic neuritis may occur without any headache and without vomiting, or that there may be slight headache and no vomiting. The author is sure that facts show that even complete recovery with good sight does not negative persisting local gross organic disease within the cranium; and this is especially true of some cases of syphilitic tumor. The fourth section of the paper treats of the diagnostic and non-diagnostic value of optic neuritis. Although so often found with disease of the cerebrum or cerebellum, it does not occur from mere destruction of any particular part of the encephalon. Optic neuritis mostly occurs with intra-cranial tumor or some other adventitious product. The mass may be in any part of the encephalon, with the possible exception of the medulla oblongata, and may produce double optic neuritis. But, on the other hand, optic neuritis may *not* be found with tumors or other masses in different parts of the cranial cavity. Then, again, it may appear late and pass off, the patient dying ultimately of tumor. It occurs exceedingly rarely in cases of extensive destruction of brain substance by softening or clot. Because, therefore, optic neuritis occurs with tumor of any part, and may not occur with tumors of many parts; because it comes on late in some cases of tumor, and passes off again in some; and because it is very rarely found with such widely destructive processes as softening and clot; and because it may not be attended by any defect of sight—it is inferred that it does not depend on destruction of any part of the nervous centers. From this our author concludes that tumor or any other adventitious product does not produce optic neuritis in its particular character as this or that kind of pathological product, but in its general character as a "foreign body"; and then not because it destroys, but by some indirect action. He then discusses the various hypotheses as to the mode of production of changes in the optic disks by intra-cranial adventitious products, and gives the arguments for and against them. The hypothesis which seems to him most plausible, when the whole of the non-localizing symptoms are taken into account, is that optic neuritis results doubly indirectly from intra-cranial tumor by vaso-motor action. At first there are changes of instability about the tumor; next, these promote discharges, by the intermediation of vaso-motor nerves, to repeated contractions, with subsequent paralysis of vessels of the optic nerves or centers, and thus at length lead to that trouble of nutrition which is optic neuritis. He supposes that all the symptoms alluded to are signs, not directly of tumor, but of an encephalitis provoked by the tumor in its character as a foreign body. He admits that swelling of but one disk is a difficulty in the way of this hypothesis being accepted as perfectly satisfactory.

85. In a short paper on *optic neuritis due to intra-cranial neoplasms*, Abadie thinks that, if the patient be a child or a young adult, the presumption is in favor of the neoplasm being isolated tubercles; but, if the patient is an older adult, the tumor is probably of a fatally progressive nature. In both classes of cases the prognosis is positively bad, both as to vision and as to life. With syphilis as the probable cause, the prognosis is more favorable. But there are some cases in which the neoplasm causes blindness without death. These patients are generally young, with no suspicion of syphilis or tubercle attached to them, but with all the symptoms of some grave intra cranial disorder. These cases, Abadie thinks, are not followed out for a sufficiently long period, for many of these patients recover with blindness, the neuritis having passed into atrophy of the optic nerves. Abadie thinks the lesion here is often a periostitis of the bones of the skull, of a circumscribed nature, which runs its course with grave symptoms, but subsides, the exudation is absorbed, and the patients' health is entirely restored, but with complete blindness.

86. In Galezowski's paper on *optic neuritis in reference to intra-cranial* *inflammation or tumor*, he considers the affection as nothing more than the consequence of progressive, descending inflammation, proceeding from the center toward the periphery; the same in nature as, but much more rapid than, the gray degeneration in locomotor ataxy. This alteration may follow the course of the optic tracts without involving any nerve of sense or motion if the intra-cranial tumor at its orgin and point of implantation is at a distance from these nerves; for the degenerative process follows but one direction and one course, namely, that of the optic-nerve fibers. A meningitis situated at the base of the brain, near the chiasm, may set up an inflammation in the substance proper of the chiasm, which, little by little, will extend to the optic papilla. On the contrary, a meningitis occupying the cerebral hemispheres might run through all these phases, and even end fatally, without there being any apparent change demonstrable in the optic papilla.

93. In his paper on *the duration of the act of accommodation of the lens*, Angelucci comes to the following conclusion, based upon careful investigations and mathematical measurements of his own: The difference in time which elapses between accommodation tor the near point and that for the far point is not in accord with the duration of the emigration of the luminous image upon the lens, for the lens changes its radius of curvature with the same rapidity in both accommodative acts; but, instead, with the muscular force, which does not induce at once that degree of sphericity of the lens demanded for the dioptric conditions.

96. Dœnch endeavors to account for *congenital dislocation of the lens*. He finds that it always affects both eyes, generally in a symmetrical manner. The direction of the displacement is almost always either upward, upward and inward, or upward and outward. The lenses are generally transparent; sometimes their size is below the mean. The suspensory ligament is sometimes found, sometimes not. In about one fourth of all the cases there is myopia. The position of the lenses may remain unchanged throughout life, but spontaneous dislocation may also result. Heredity has been proved in some of the cases.

102. Watson advises *opening the capsule before making the corneal section in the operation for cataract*. The advantages of this preliminary step he thinks are four, viz.: 1. The dilated pupil allows of the free and visible movements of the cystitome. 2. The margin of the pupil is less liable to injury than in the old method. 3. The relative bulks of the nucleus and cortex can be ascertained before making the corneal section. 4. The operation is thus rendered easier and safer. [This is questionable.]

103. Pagenstecher's paper upon the *extraction of cataract with the capsule* is an admirable discussion of an important and very interesting branch of ophthalmic surgery. He thinks the difficulties of introducing the flat, shallow spoon for the removal of lens and capsule, and the dangers arising from prolapse of the vitreous, have been greatly overestimated. The advantages he claims for this method are as follows: 1st. The gain of a perfectly clear pupil. 2d. The absence of plastic and recurrent iritis. 3d. There is no danger of any diminution of the resulting vision through clouding of the capsule, and consequently no necessity for any secondary operation. 4th. The very best degree of visual acuity. 5th. Recurrent hæmorrhages are much rarer than when the capsule is left behind. 6th. The dazzling sensations due to diffusion of light through the capsule are done away with. 7th. There is no prolapse and cicatrization of the capsule in the wound. The disadvantages which he enumerates are as follows: 1st. The healing of the wound is in some cases somewhat slower than by the other methods. 2d. Vitreous opacities are more frequent. 3d. The average resulting astigmatism is somewhat greater than after extraction without the capsule.

104. Fort's paper upon *the latest improvements in the operation for cataract* consists really in describing the operation as it is done in Paris. A modified Listerism is carefully carried out in all cases, the antiseptic fluid used being generally phenic acid. The incision employed is the superior keratotomy, and, as a rule, an anæsthetic is not employed. As soon as the lens has been extruded, the blepharostat is removed and a solution of escrine is instilled. Fort lays great stress upon what he calls the *toilette* of the anterior chamber, which consists in carefully and patiently removing the extravasated blood, the crumbs of soft cortical matter, and bits of pigment from the anterior chamber and lips of the wound, and smoothing the cut edges of the coloboma of the iris into place. When an attempt is to be made to remove lens and capsule together, the patient is anæsthetized and superior keratotomy is done. After the iridectomy, the teeth of a pair of forceps are introduced through the wound, and the capsule and zonule are seized and drawn out to the wound. If traction fails, a curette is to be introduced behind the lens, even into the vitreous, and the lens extracted.

105. Webster reports eleven cases of *sympathetic inflammation following operations for cataract.* In four cases both eyes were lost. In one case the eye causing the sympathetic inflammation was lost, and the other eye was badly damaged. In one case the eye causing the sympathetic inflammation was lost, while the other eye recovered in good condition. In one case the eye causing the sympathetic inflammation recovered with perception of light, while the other recovered with slight damage. In one case the eye causing the sympathetic inflammation retained useful sight, while the eye sympathetically inflamed gave promise of recovery. In two cases both eyes recovered in good condition. In one case the eye sympathetically inflamed was lost, while the eye causing the sympathetic inflammation retained good vision.

121. McHardy's article on the practical employment of *the electro-magnet in aiding in the detection and removal of particles of iron and steel within the eye* contains some good practical suggestions. Among others, he speaks of the pain experienced by some patients when the injured eye is brought well within the range of the pole of the magnet. This pain he regards as a proof of the completion or interruption of the galvanic current which induced the magnetic action, and therefore as furnishing conclusive evidence not only of the lodgment of a particle of iron or steel, but also that the magnet is exercising a sensible traction thereon. This pain-test he regards as important, as demonstrating the presence of a foreign body, of iron or steel, within the eye.

123. Noyes reports a case of *buphthalmus, with central anterior synechia, cured by total removal of the iris.* An incision was made, about 4 mm. long, with the point of a Graefe's knife thrust at a tangent into the vicinity of the origin of the iris. A small, sharp hook was then pressed between the iris and the cornea flatwise, and pushed across until the iris on the far side of the chamber, near its periphery, could be entangled in its point. It was rotated upon itself so as to secure a good bite of the iris, and traction was then made to loosen the peripheral margin. It yielded easily, and about half the iris was thus torn away. The remaining iris was then withdrawn with forceps. Very moderate bleeding occurred. On the fourteenth day the eye was healed, the staphyloma was much reduced, and the patient was discharged. Three months later the eyeball was found of less than normal size, but not soft.

126. Luchhau found *disease of the eye in relapsing fever* in six cases out of one hundred and eighty, or three and one third per cent. In three of these cases the complication was iritis of one eye, and in one of these cases a large hypopyum. All three cases were cured, but in one there remained a punctate vitreous opacity, which produced misty vision. In two other cases there was optic neuritis. The sixth case was iritis with hypopyum, which was cured, but with a second relapse of the fever appeared also a bilateral irido-cyclitis, which turned out badly, with permanently impaired vision.

129. Rampoldi, in his paper upon *the connection between disease of the digestive organs and disease of the eye*, devotes special attention to diseases of the stomach accompanied by hæmorrhages. Various pathological changes occur in the eye after gastric hæmorrhage. These changes should be sought in an irritated condition of the optic nerve, which follows closely upon the hæmatemesis, whatever may be the tie which connects the two affections so intimately as to make us doubt its being pure coincidence. The prognosis is in the majority of cases very grave, even more so than in the cases of amblyopia caused by profuse metrorrhagia, without our being able to say why it is so. The obscure pathogenesis and the strangeness of the affection make these cases of great interest.

135. Pagenstecher has a long article upon the employment of *massage in diseases of the eye.* The manner in which he makes use of this method is as follows: By means of the thumb or index-finger he makes pressure upon the edge of the lid and rubs the latter rapidly against the eyeball in both a radiating and a circular direction, the former being regarded as the more important. The influence exerted is upon the conjunctival circulation and indirectly upon the intra-ocular circulation. He employs massage in chronic pustular conjunctivitis, especially in old people and in the hypertrophic form; in scleritis and episcleritis; in diseases of the ciliary body in which the pain is not very marked. He regards it as a very valuable adjunct to ophthalmic therapeutics.

136. Nieden advocates the employment of *electrolysis in the treatment of certain tumors of the eye and its appendages.* The advantages are: 1. Its applicability for the removal of neoplasms where other means fail or are of too uncertain and dangerous a nature. 2. Cavernous, angiomatous, and teleangiectatic tumors may be destroyed without entailing a loss of substance of the normal coverings. 3. The effect to be attained may be accurately determined by the number of needles introduced, the number of cells used, the duration of the application, and the strength of the electric current. 4. There is scarcely any loss of blood, and the pain is very moderate. 5. The application is easily learned, and quite free from danger. Nieden does not believe in the efficacy of electrolysis in the treatment of corneal or vitreous opacities, iritic membranes, or cataract.

137. Saltini has employed the *bisulphate of quinine in idiopathic hemeralopia* with success. The patients were sixteen in number, fifteen males and one female, the symptom having lasted from twenty to forty days. Five of these patients were very poor and in bad health, and two decidedly marasmic; the others were all in robust health. In five cases there was extensive atrophy of the choroidal pigment, in four cases slight circumpapillary opalescence of the retina, and in one case only a whitish papilla with very small arteries. In the other cases the fundus was normal. To all of these sixteen patients Guaita gave one gramme of the bisulphate of quinine in twenty-four hours, and afterward forty to fifty centigrammes of the salicylate of sodium to each dose of quinine. Six of the patients never returned after the first visit. Of the remaining ten cases, complete recovery occurred in four and very marked improvement in six cases. The number of cases is, however, too small to draw conclusions from.

139. In making their experimental researches into the physiological action of *mydriatics and myotics*, Fitz Gérald and Laborde employed hypodermically morphine, salicylate of eserine, hydrochlorate of pilocarpine (the latter also locally in the eye), nitrate of aconitine locally and hypodermically, and atropine locally and hypodermically. Their general conclusions are as follows: 1st. The effects of substances which act upon the iris, producing either a contraction or a dilatation of the pupil, differ essentially according as the substances are introduced by physiological absorption or by local application. 2d. Among the substances classed as myotics, some, like morphine and eserine, produce this contraction by an actual influence upon the oculo-motorius, and by a functional irritation, either of its conducting fibers or of the cells in the nucleus of origin. 3d. Others, as pilocarpine, seem to exercise a simultaneous paralyzing action upon the sympathetic and the third pair, so as to permit of an ultimate predominance of the sphincter of the pupil. 4th. The functional action of the ophthalmic branch of the fifth pair seems to play an active part in the production, by mechanical reflex, of myosis or of mydriasis, after the local application of substances which excite the one or the other of these effects. 5th. The mydriatic action of atropine seems to be the effect of a functional paralysis of the third pair. 6th. The peripheral or local action of these various substances is exerted directly upon the contractile property of the unstriped fibers of the muscle of the iris, and perhaps simultaneously upon the ganglionic cells of the iris tissue.

140. Schäfer's paper upon *the comparative value and activity of atropine, duboisine, and homatropine in ophthalmic therapeutics* is exhaustive. He finds that atropine dilates the pupil more slowly than duboisine, but its effect lasts longer. Homatropine dilates the pupil more quickly than either of the two other drugs, but the dilatation is less and its duration is shorter. The strength of the solution of homatropine exerts no apparent influence upon the duration of its effect. The accomodation is most quickly paralyzed by duboisine, and next by homatropine; but the effect of the latter lasts only abou twenty-four hours, while that of duboisine lasts three or four days. The paralysis of accommodation from atropine is more gradual in its onset, and lasts the longest. Homatropine is to be preferred for simple dilatation of the pupil, or for paralyzing the accommodation preparatory to determining the refraction; but as a therapeutic agent it is inferior to both duboisine and atropine. Schäfer found it possible to break adhesions with duboisine which had resisted the action of atropine. No conjunctival irritation was produced by either duboisine or homatropine.

OTOLOGY.

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2. Baber, in a short article upon the use of *the tuning-fork in the diagnosis of diseases of the ear*, refers to the effect of pressure exerted on the ear on the perception of the tuning-fork vibrations. On applying a sounding tuning-fork to the median line of the head, if one meatus be closed, the sound of the fork, which, on closing the ear lightly, is heard loudly in the obstructed ear, if the finger be pressed inward, diminishes in the closed ear with the amount of pressure exerted, until the sound is heard only slightly, or not at all louder in the closed than in the unclosed ear. The same takes place with the voice if any note be continuously hummed. In this experiment, the air in the meatus, becoming condensed, doubtless forces the membrana tympani inward and with it the ossicles. This phenomenon, Baber thinks, admits of two interpretations: 1, It may be considered due to the inward pressure of the ossicles, causing slight pressure on the labyrinthine fluid, by which the functions of the labyrinth are temporarily interfered with; or, 2, It may be attributed to the impediment to the vibrations of the ossicles, produced by their altered tension. The fact of the sound-waves—which are reflected from the obstruction in the meatus—having to pass through a tympanic apparatus of which the tension is abnormal probably weakens their effect on the labyrinth.

3. Gruber's paper upon *diminishing and increasing the air in the external auditory canal as a means of treatment in diseases of the ear* is very interesting. The hyperæmia in the canal, artificially produced by exhausting the air in the canal, can only be produced by the blood being drawn from the vessels of the deeper structures of the ear, and thus the latter are depleted. This motion in the blood current is propagated to the labyrinth, and even to the cavity of the skull. Moreover, this increased or diminished atmospheric pressure exerts the most varying influence upon the motility of the drum membrane and upon that of the ossicles. Hence, anomalies of the drum membrane, pathological changes in the ossicles and their joints, in the Eustachian tubes and the mastoid cells, will all modify the effect of changes in the atmospheric pressure in the external auditory canal. In many cases, Gruber thinks, the air-douche through the Eustachian tubes might with advantage be replaced by increasing or diminishing the atmospheric pressure in the external auditory canal. In most of the cases where inflation of the Eustachian tubes is indicated it should be aided by this withdrawal or increase of the air-pressure in the external auditory canal, as improvement in the hearing is often thereby produced.

4. In a paper upon the value of *pain as a symptom of ear disease*, Field calls attention to the fact that pain which has its origin in the ear is by no means localized in that organ; it may be either in front of, above, behind, or below it, indeed, anywhere on the same side of the head, and, perhaps, on both sides. The external, middle, and internal ear have all very far-reaching nerve connections. In front of and above the external ear are ramifications of the auriculo-temporal branch of the third division of the fifth; behind, above, and below are the small occipital and great auricular branches of the cervical plexus. Immediately behind the pinna the auricular branch of the pneumogastric comes to the surface and gives rise to very important communications. All these nerves anastomose in and around the pinna. In the tympanic cavity we find an equally wide-reaching plexus: the tympanic branch from the petrous ganglion of the glosso-pharyngeal communicates with the great superficial petrosal, which passes to the spheno-palatine ganglion, its small superficial petrosal twig goes to the otic ganglion, and a third filament passes to the carotid plexus of the sympathetic. All these nerves are united in the tympanic plexus, and pain produced in the tympanum may radiate over the wide area which they occupy.

5. In their paper upon *the vaso-dilating nerve fibers of the ear*, Dastre and Morat have analyzed Snellen's reflex as follows: 1, The centripetal path which conducts the irritation to the cervical cord consists of the second pair of spinal nerves, the origin of the auriculo-temporal; 2, Experiments prove that irritation in the cord follows a descending course, to pass out below the seventh cervical nerve; 3, The irritation makes its exit from the cord by communicating branches which go to the first thoracic and the inferior cervical ganglia. These communicating branches are the true auricular vaso-dilating fibers, and that portion of the cervical division of the cord which transmits the irritation to them constitutes for the ear a vaso-dilating center. The auricular dilators and constrictors have different origins in the cord, though they are adjacent. There is a cervical vaso-dilating center, and below it a thoracic vaso-constricting center. Both belong to the system of the great sympathetic.

9. In Gruber's article upon *cartilaginous and osseous neoplasms in the ear* he coincides with the views of Delstanche and Hedinger that the so-called exostoses are in part pure osteomata, in part osteoid structures, due to a hyperplasia consequent upon inflammation. Cartilaginous neoplasms he regards as the rarest of all new formations in the ear. He reports three cases, and a microscopic examination of one of the growths proved it to be an ossified chondroma.

15. Raynaud's paper on *diabetic otitis* is illustrated by one marked case, in which he was fortunate enough to obtain an autopsy. The otitis was of the ordinary form of acute inflammatory otitis hæmorrhagica, marked by great pain and a profuse discharge, which at first was bloody and subsequently became serous, but never became purulent. There was a small perforation in the membrana tympani, and the membrane itself was covered by a whitish exudation, pseudo-membranous in character. The mucous membrane of the tympanum was red, bleeding, and granulating, and the tympanic cavity contained a reddish, puriform fluid. The ossicles were in place, and a small blood clot was found near the stapes. The mastoid cells were filled with a reddish liquid containing pus cells, and their lining mucous membrane was red and softened. The osseous substance was injected and inflamed, but the vestibule, cochlea, and semicircular canals showed no alteration. This osteitis of the petrous and mastoid portions of the temporal bone was no doubt due to the diabetes, bony lesions being by no means rare in this disease.

17. Gottstein calls attention to the frequent occurrence of *diseases of the ear in the course of acute exanthemata* and all acute infectious diseases. He cites in particular three cases in detail. One was acute inflammation of the middle ear with perforation, occurring in the course of measles, and resulting in a cure. Another was croupous inflammation of the velum, pharynx, nose, and both tympanic cavities in the second week of scarlatina, with otorrhœa, and ending in a cure. A third was a case of diphtheria of the throat with diphtheritic otitis of the left side, coming on in the second week of measles, and also ending in a cure. Hence he insists upon the necessity of examining the ears at an early period in all these diseases, in order to institute proper treatment at once, and prevent disastrous results.

18. Luchhau found *disease of the middle ear in relapsing fever* in fifteen out of one hundred and eight cases, or eight per cent. However, the aural complication does not result from direct extension of the disease from the pharynx, for usually the throat and

Eustachian tube are intact. In only one of his fifteen cases was there any pharyngeal catarrh. The prognosis is favorable, provided proper treatment has been begun early enough in the course of the disease; for, if there has been perforation of the drum membrane and suppuration for a considerable period, there is but little chance of restoration of perfect hearing. If no suppuration has occurred, Luchhau recommends local abstraction of blood, and morphia for the pain. If suppuration is evidently present, paracentesis of the drum membrane must be performed at once. The after-treatment consists in washing out the cavity with a warm one-per-cent. solution of carbolic acid, and inflation of the Eustachian tube and drum cavity.

19. Gruber discusses *the advantages of dividing the posterior fold of the membrana tympani.* When this fold has become thickened and immovable, the hammer is impeded in its physiological movements, and indirectly the other ossicula also. From this result many secondary changes in other parts of the ear, such as subjective noises, attacks of vertigo, etc. Gruber has done the operation upon the drum membrane recommended by Lucae, and has found that it is of value only in exceptional cases. It is only in those rare cases in which the folds run directly backward that the vertical division of the folds is of any value. The same may be said of the vertical division in the center of the fold, recommended by Politzer. The vertical division of the fold in the drumhead is useful in acute and chronic processes in the middle ear, where the leaves of the fold have not undergone any further pathological change. Where the fold runs in a curve over the posterior segment of the drumhead, and where any of the abovementioned pathological changes have occurred, nothing can be expected from a simple vertical division. Here the incision must run in the longitudinal axis of the fold, either through the axis, or through the fold, parallel with the axis.

32. Steinbrügge reports an extremely interesting case of a *chronic suppurative disease of the middle ear with sudden mastoid complication*, in which the mastoid was trephined, and the patient subsequently died of *miliary tuberculosis.* At the autopsy there was found tubercular basilar meningitis, caries of the left temporal bone; cheesy degeneration of the lymphatic glands; and miliary tuberculosis of the lungs, spleen, liver, kidneys, and serous membranes. Of the organs of special sense, the eye was most affected, probably by a transmission of inflammatory processes within the sheaths of the optic nerves. The dilatation of the pupils before disturbance of vision set in and the irregularity in their size at a later stage are not common symptoms, and are difficult of explanation. A direct transmission of the morbid process to the brain could not be discovered in any part of the pyramid or of the dura mater in its vicinity. It is impossible to say whether the whole condition of the middle-ear affection was not caused by a tuberculous diathesis, to which there was a distinct family tendency. If it had been possible to make any early diagnosis of basilar meningitis, independent of the disease in the temporal bone, the operation would not have been undertaken.

26. Pomeroy reports an interesting case of *intra-cranial tumor* in a child, with the results of the autopsy. The early development of the tumor was from the neighborhood of the *tympanum*, as the first symptom of the disease was paralysis of the sixth nerve, then of the third, and soon afterward of the facial. As the paralysis of certain muscles of deglutition did not occur until some time after that of the facial muscles, it was inferred that the anterior portion of the facial, in the hiatus Fallopii, was invaded by the tumor somewhat later. The growth was beneath the dura mater, and filled the left middle cranial fossa and a portion of the anterior and posterior fossæ. The surface of the growth was nodular, and one of its pedunculated projections passed under the left anterior clinoid process, displacing the nerves and vessels in this region. There was a large brain-like growth situated in the region of the left ear, measuring four inches across the base and five inches in the vertical direction. It did not project through the external auditory canal, but through the point of attachment of the pinna to the head, in front and behind. On microscopical examination it proved to be myxo-sarcomatous.

27. Baratoux's paper on *changes in the ear in deafmutism* is interesting. In cases of this sort hitherto examined anatomically, there have been found anomalies of the labyrinth, such as partial and even total absence of the semicircular canals, but no lesion of the cochlea has been described. Baratoux furnishes the report of a case in which there was partial defect of the organ of Corti, though there was no change in the semicircular canals. The vessels of the cochlea were found very much enlarged and their walls thickened. The canaliculi of the osseous lamina were dilated and the lamina diminished in thickness. But few nerve fasciculi existed here, and these were without a medulla sheath. No cells of the plexus of Rosenthal were visible. The spiral angle was very vascular, and contained enormous lacunæ and numerous vessels with hypertrophied walls. The holes in the perforated zone no longer existed except in a few spots. There was not a trace of the elements of Corti. The auditory nerve was atrophied and surrounded by thickened connective tissue. There was no axis cylinder in any of the fibers, but their sheath was thickened and their nuclei were hypertrophied. In other words, the case was one of parenchymatous neuritis with absence of the organ of Corti.

29. Schwartze reports a very interesting case of *punctured wound of the middle ear, with escape of cerebro-spinal fluid*, accompanied by severe symptoms of cerebral irritation induced by cerebral hyperæmia. The wound was produced by a knitting-needle, which lacerated the drum membrane in the region of the stapes. The watch was not heard at all, when held either against the ear or on the mastoid. All notes of a tuning-fork were heard best in the injured ear, no matter from what part of the skull they started. The flow of cerebro-spinal fluid was very profuse, and lasted eight days. The patient finally recovered in about five weeks, with complete deafness on the injured side.

31. Zaufal recommends *disinfection of the air or vapor used for inflating the Eustachian tubes and middle ears.* He does this by means of a disinfecting capsule which contains a ball of cotton-wool, or, better, the material used for Lister's bandages. This retains what particles of dust or spores may be floating in the atmosphere, and prevents their introduction into the tympanic cavity during inflation.

32. Knapp speaks highly of *the cotton pellet as an artificial drumhead.* He claims for it the following advantages: 1. Moistened with glycerine and water, these pellets are a great aid to hearing in many cases of partial or total defect of the drumhead, with or without otorrhœa. 2. Their therapeutical action in arresting profuse discharge, and at the same time preventing the mucous membrane of the drum cavity from drying up, is most valuable. 3. They protect the deeper parts of the ear against injurious influences of the atmosphere. In some cases they may be worn for a lifetime with permanent comfort and benefit.

SEMI-ANNUAL REPORT ON PSYCHOLOGICAL MEDICINE.

No. III.

By NORTON FOLSOM, M. D.,
BOSTON.

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6, 7. Dr. Noble believes, with regard to American *public-school training and insanity*, that not only has the former failed to afford power of mind and originality of thought to the pupil, but tends directly to produce mental weakness and disease—that too many branches are undertaken, and the teaching is superficial, while at the same time the immature brains of the young are overtaxed. He adduces the prevalence of pauperism and insanity in New England, where high pressure in education is also supposed to be at a maximum, in proof of the relation between the school system and mental deterioration, and quotes the opinions of several hospital superintendents in support of these views. ═══ Dr. Jewell takes broader ground and regards civilization, as we find it in the past and present, as containing or carrying with it the causes of decay of the nervous system, and consequently the ultimate destruction of the human race. He thinks the higher degree of specialization and refinement in function of the nervous centers, due to the pursuit of art and literature, is a source of disease on account of a loss of balance or symmetry, the sensitive side of the nervous system preponderating over the motor. The effort to accomplish more than the machine is constructed to do is a result, and this begins with educational pressure in youth, and continues in the struggle for wealth and the rage for speculation which prevail in adult life. [Although the influence of mental strain and over-exertion in causing nervous disease, on which Dr. Jewell lays so much stress, can not be denied as a clinical fact, it would be interesting to learn what light statistics would throw on this subject, and it may be doubted whether in reality this influence is not even more often indirect, through derangement of bodily nutrition, inducing the use of stimulants, etc., than direct. Investigations published in Massachusetts at one time seemed to show that the occupation most likely to lead to insanity, in that State, was that of *farming*. If this were confirmed at the present time, it would tend to prove that habitual excessive muscular exertion, with a lack of society and a minimum of mental stimulus, and with a monotonous and coarse diet, is really more dangerous to mental health than the excitement and irregular strain of a business life, in spite of the use of alcohol, tobacco, etc., with the compensation of better food and protection from the elements. It is well known that the city boys stood the strain of army life better than the country boys in the late war, and it is evident that we have not yet learned everything about the comparative safety of different kinds of over-exertion. But, as Dr. Jewell says, development should be symmetrical, and a balance should be preserved in the labors of mind and body, if decay is to be avoided. Dr. Jewell thinks that many children suffer from the adoption of arbitrary or uniform standards in education, resulting in the systematic over-taxing of the less intelligent, in the public schools; the amount of time to be spent in study is generally too great; the fixed use of the eyes is a direct cause of cerebral irritation, and the hygienic arrangements of school-houses are generally defective. In academies for both sexes, and in colleges, the over-pressure is still kept up—emulation and ambition, and injudicious spurring-on by teachers who, possessing themselves a vigorous nervous system, can make no allowance for others' lack of vigor (made more probable by the process of natural selection, or survival of the fittest, in which the weaker instructors die of consumption or become insane, while the tough ones pull through). Dr. Jewell does not allude to a special source of danger which exists in the rapidly prevailing custom of depending on annual or semi-annual examinations in determining scholarship, rather than on daily or weekly progress. This leads to the detestable practice termed "cramming," which has ended in many a case of nervous disorder, and directly impairs the solidity of the scholarship attained. In Harvard University, at the present time, there being no uniform system adhered to, some instructors depend principally upon examinations and some do not, and the average student may be depended upon to find out very accurately how far cramming will suffice for the maintenance of his credit, and, equally, to take advantage of it in every possible instance. The result is that, in certain instances, disturbances of nervous functions, or partial breaking down at a given time, could be confidently predicted from an analysis of the order of studies. That this should be so in the leading university in the country, and that it should be drifting into a worse condition in this respect as rapidly as it increases in size, is the more remarkable because, while the government of the university is supposed not to have any particular regard for the health of the students, *per se*, it is supposed to care greatly for its prestige and its standard of scholarship, and these can not fail to suffer in the future unless there is a change.]

10. Dr. Winn, in his paper on *the prevention of insanity*, imagines that he has demonstrated the existence of a certain entity which he calls "morbific force," and to the correlation of this force he attributes the occurrence of various dissimilar constitutional diseases, including insanity, scrofula, phthisis, skin diseases, etc., in particular families. He remarks that Mr. Jonathan Hutchinson's views upon "Some of the Principal Diatheses and their Mutual Relations" tend to confirm his own, though Mr. Hutchinson *excludes* insanity and includes syphilis. He likewise derives comfort from the well-known fact that various nervous disorders run into each other and interchange places, both in individuals and in families. That insanity is due to morbific *force*, he deduces from having made the observation [with singular acuteness] that a certain gentleman was violent during the paroxysms of acute mania. When he got well "it was like the clearing of the atmosphere by a thunderstorm," which supported his theory that there were latent morbific forces in the system. Dr. Winn's prophylaxis of hereditary disease involves the questions of hygiene and marriage. He remarks that moral education should begin in infancy, and he would "combine firmness with tenderness." [No one can doubt that a *firm hand* is efficient in eliminating "morbific force" from a child, or that tenderness is pretty sure to result from its application.] He would not prohibit a mother from nursing her child, provided she was strong and had plenty of milk, "even if she belonged to a family where there was hereditary disease," and he justly exclaims, "How few of us can boast of an ancestry entirely free from it!" [As to marriage, Dr. Winn is frank, though pensive. When he has been called upon for advice to young people about to marry, and, like Mr. Punch, has said, "Don't!" he has generally found it useless. Yet he feels no doubt that when there is hereditary taint on both sides there is danger in their marrying, even if the form of disease is not the same. He is undoubtedly correct in saying that the general rule of transmission is from parents to their children, and from them to the grandchildren! This view can hardly be regarded as new, though it may have resulted from original observation. Though in several rules which Dr. Winn formulates his prognosis is decidedly grave as to disease resulting from marriages, he declares with singular positiveness that if *both* are in good health and *free* from ancestral contamination ("but how few are!") there can be no reasonable objection to the marriage of cousins!

With this exception Dr. Winn's article is harmless and amusing in its ponderous simplicity.]

11, 12, 13. In commenting on the formation of the "National Association for the Protection of the Insane and the Prevention of Insanity" at Cleveland, O., on the first of July last, the "British Medical Journal" dwells on the importance of efficient State supervision of *lunatic asylums*, and pays a tribute to the excellent working of the English Lunacy Commissioners' Board. It takes exception to the plan of the Association of placing asylums on the same footing as other hospitals, giving them the privilege of a consulting staff of general practitioners, with the significant comment that it is usual for the general practitioner to consult the specialist, not for the latter to call in the former. The "Journal" remarks that it appears strange that, in these days, the insane should require the protection of an association, national in character but special in object, and suggests that the habitual use of mechanical restraint in the treatment of the insane in the majority of American asylums [*sic !*] may be sufficient to account for the movement! [Probably many of those most familiar with the management of American asylums, and most interested in the welfare of the insane, are inclined to doubt whether the National Association is not likely to do more harm than good. The Association of Medical Superintendents of American Institutions for the Insane has been denounced by some would-be reformers as a close corporation, devoted to mutual admiration and resistance to progress; but no impartial person familiar with its proceedings and the published writings of its members would deny its vast influence in improving the condition of the insane during the thirty-five years of its existence. If the National Association ever proves to be a useful institution, it is likely to be from its having recently admitted to membership a considerable number of these very medical superintendents, who have probably joined more from the praiseworthy idea of preventing mischief than from any sympathy with the original organization. The amount of mechanical restraint in use in American asylums has been much exaggerated, and the views of American alienists misrepresented. In Dr. Kirkbride's recent work on "Hospital Organization," the chapter on Restraint, which is said to reflect American opinion on this subject, is a model of wisdom and moderation, in marked contrast with the diatribes of some self-constituted experts, who seem to be inspired more by desire for self-aggrandizement and the indulgence of personal spite than by any genuine interest in the welfare of the insane. It is certain that the recovery of these afflicted persons depends in many instances upon their early transfer from familiar surroundings, and irritating contact with the world, to the control and professional treatment of these much-maligned hospital superintendents. Any agitation which unwarrantably shakes public confidence in the management of these institutions works directly and sometimes fatally to the detriment of those who become insane, by preventing their getting proper advice till after the period when recovery is possible. The usefulness of mechanical restraint would seem, at first thought, to be a scientific question which could be dispassionately considered, and on which honorable men might differ without loss of mutual respect; but there appears to be something about it especially liable to excite personal feeling and strong language. Even Dr. Shaw (in his article on "Non-restraint," in the "Archives of Medicine"), whose good faith and earnestness none can doubt, and whose recent experience at the Kings County Asylum has convinced him of the advisability of abandonment of all apparatus, is betrayed into a dictatorial tone and a censorious attitude. One would say that as soon as a man is convinced that mechanical restraint *can* be dispensed with he acquires a belief in the moral deficiency of all who do not agree with him. The truth is that, both in theory and in practice, there is something to be said on both sides. No one doubts that the change from the excessive, almost invariable, use of apparatus of former times is an immense gain. American superintendents, as a rule, have *not* been slow to recognize the progress of ideas, and to profit by it, and they may be implicitly trusted to arrive at sound judgment in this and other matters. It is interesting to note that a tendency to reaction against complete non-restraint is reported in Great Britain, and impartial observers state that a change in method of applying force is much more frequent than its complete abandonment. At a meeting last year of the Medico-Psychological Society of Paris, during a discussion of restraint, M. Magnan was recorded as "the only non-restrainer present," and even he confessed to the use of packing.]

40. Dr. Kiernan finds *rheumatism productive of certain psychical changes*, which may be of acute or chronic type. The chronic type is characterized by melancholia, followed by systematized delusions, and these again by a mental state resembling general paresis. Rheumatism often produces temporary improvement in chronic psychoses. The acute form has a good prognosis, if not fatal; the chronic form, a bad prognosis as to ultimate recovery. Heredity plays an important part as a predisposing cause. Intercurrent cardiac affections apparently influence the nature of the delusions.

41. *The sphygmograph in general paralysis of the insane* gives evidence of venous engorgement and a feebly acting heart.

42. [Dr. Hughes narrates some cases of nervous disease which he asserts illustrate the possibility of *consciousness during epileptic seizures*, but he does not prove it. He confines himself to assertions, and mildly abuses those who believe that unconsciousness is characteristic of true epilepsy, calling them "doubting Thomases."]

43. The minute investigation of eight cases of complete *dementia resulting from epilepsy*, including microscopic examination of the brain, showed that, while in some cases lesions existed similar to those found in general paralysis, in others there was no appreciable alteration of structure of the brain or its membranes.

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Miscellany.

THERAPEUTICAL NOTES.

Belladonna. — Dr. Henry Colley March, in a paper entitled "Some New Uses of Some Old Remedies," read before the Manchester [England] Medical Society ("Medical Times and Gazette," March 19, 1881), speaks as follows of the use of belladonna as a stimulant to respiration, particularly in cases of bronchitis in children: "Now, it seems to be precisely a stimulant to the respiratory centers that we need. The minute tubes fill up with a thin froth; the mucous membrane seems insensible to its presence; the child has not learned to cough; nervous symptoms threaten, and perhaps convulsions supervene. In such cases belladonna is a trusty remedy. To a six-months infant give one minim of the tincture every hour. Presently, if necessary, very slightly increase this quantity; but, as soon as the faintest improvement is manifest, reduce the dose lower and lower. The secretion into the tubes will be lessened, the cough will grow more frequent, the head symptoms will subside. Some practitioners always give a patient as much of a drug as he will bear, short of his being poisoned. Surely the scientific plan is to administer as little as will produce the desired effect. The therapeutic action of a medicine such as belladonna is not the same as its physiological action, though both are expended on the same organs and on the same tissues. The dose, therefore, should be lowered before the production, or, at least, at the first sign, of any special physiological effect. In the present case, the object is to stimulate a nervous center. But over-stimulation ends either in spasm or in paralysis. We give, for instance, digitalis, to slow the heart's action. If the dose is increased, the sedation is augmented. But presently a point is reached when, all at once, the cardiac beats become tumultuously rapid. The inhibitory fibers have been over-stimulated, and suddenly they are paralyzed. If, instead of this, the dose of digitalis be gradually lessened as soon as it has produced the desired sedative or tonic action, this may often be kept up with a surprisingly small quantity of the medicament. . . . As regards tincture of belladonna in capillary bronchitis, there can be no objection to combine it with small quantities of ipecacuan wine—to give them, say, in equal parts. Moreover, in chest affections, as in some others, it is often advantageous to administer ammonia, not exactly because it is a stimulant, but because it prevents hæmic stasis. . . . There is a prevalent notion that diaphoresis is necessary in cases of high temperature or dry skin. Of course, when the skin is bathed in moisture, the evaporation that goes on in a sufficiently dry atmosphere considerably reduces temperature; and it is certainly true that perspiration is excrementitious, for this reason among others, that it contains urea. So that diaphoresis is of service when a patient is suffering from a cold, or from rheumatic pains, the result of checked perspiration. But we must all have seen cases of fever—typhoid, scarlet, and even rheumatic fever—that got easily well without any sweating at all, and, indeed, that often seemed to do better than others. Diaphoresis, however admirable in some respects, is an exhausting process, and is not even a cooling one if evaporation be hindered by abundant clothing. Is it not pitiful to see a child, burning in the fever of measles or bronchitis, lying under a mountain of blankets, swathed in flannel, sandwiched in poultices, placed within range of a red-hot fire, and swallowing diaphoretics?" ═══ Tacke ("Berliner klinische Wochenschrift," 1881, No. 6; quoted in "London Medical Record," Apr., 1881), having injected sulphate of atropia subcutaneously for eczema in a female patient ($\frac{1}{200}$ grain twice daily for two days), noticed that the menses, which had been very profuse, became moderate and remained so. The same result he has seen follow five times in two other patients, and in a case of hæmorrhage from the lungs the hæmorrhage twice ceased immediately on the injection. He holds that as a remedy for visceral hæmorrhage it is preferable to extract of ergot: (1) on account of its certainty, and (2) because, in the strength used by him (about $\frac{2}{5}$ grain to an ounce of distilled water), it does not cause the inflammation which almost invariably follows the subcutaneous injection of extract of ergot. ═══ In the "Norsk Magazin for Lægevidenskaben," III, x (quoted in "London Medical Record," May, 1881), Dr. C. J. Ellefsen relates the case of a man, 48 years old, who had previously been healthy, but for seven days had had no alvine evacuation, and for the last two days had had feculent vomiting. The abdomen was distended and extremely tender; the extremities were cold; the pulse was frequent and very weak; no fæces could be found in the rectum. Various laxatives and enemata had been used without effect. He was ordered four centigrammes [about 0·6 grain] of extract of belladonna every hour. After he had taken five doses the vomiting ceased; and after five doses more he had a copious evacuation, and rapidly recovered, without any symptoms of belladonna poisoning. ═══ In a summary of one of M. Jules Simon's lectures on infantile therapeutics, M. Caradec ("Tribune Médicale," Mar. 13, 1881) remarks that children bear belladonna as well as adults, that M. Simon has given as much as 120 drops of the tincture to a girl 13 years old, without harm, and that he usually carries the action of the drug so far as to produce incipient toxic effects—flushing of the face, dilatation of the pupils, and irritability of temper; but in divided doses, enlarged progressively. ═══ M. Anger (quoted in "Union Médicale," April 14, 1881) applies compresses wet with a solution of sulphate of atropia (1 : 1.000) to calm the pains of cancer. They should be covered with an impermeable fabric, and should be renewed every three or four hours. They give marked relief without producing general symptoms. ═══ M. Guéneau de Mussy (*Ibid.*, Jan. 23, 1881) recommends a pill of one centigramme [$\frac{1}{6}$ grain] of extract of belladonna, just before meals, for the vomiting of phthisical patients.

Carbolic Acid.—M. Lucas-Championnière ("Chirurgie Antiseptique," etc., 2me éd., Paris, 1880) indorses Nussbaum's suggestion to rub the hands with a mixture of one part of crystallized carbolic acid and nine parts of vaseline before beginning an operation that is to be conducted under the spray, in order to avoid the unpleasant effect of the spray upon the hands. ═══ The same author (quoted in "Union Médicale," Feb. 20, 1881) recommends the following formula for an antiseptic solution, in which the odor of carbolic acid is mitigated: Crystallized carbolic acid, 50 parts; thymol, 1 part; glycerine, 50 parts; water, 1,000 parts. ═══ M.

Guenot ("Concours Médical," May 21, 1881) relates a case of facial erysipelas and one of malignant pustule, in which signal benefit followed injections of a two-per-cent. solution of carbolic acid into and around the inflamed parts. Sixteen drops of the solution were injected at each puncture, of which five were made in the one case and seven in the other. ═══ The "Canadian Journal of Medical Science" for May, 1881, gives the following formula for an improved styptic: Collodion, 100 parts; carbolic acid, 10 parts; tannin, 5 parts; benzoic acid (from the gum), 5 parts. Mix the ingredients in the order here written until perfect solution is effected. The preparation has a brown color, and on evaporation leaves a firmly adherent pellicle. It instantly coagulates blood, forming a consistent clot, and a wound rapidly cicatrizes under its protection.

London International Medical and Sanitary Exhibition.—The Exhibition Committee (Mr. John Eric Erichsen, F. R. S., Chairman; and Mr. Mark H. Judge, Secretary) announce that arrangements have been completed for holding the International Medical and Sanitary Exhibition initiated by the Executive Committee of the Parkes Museum of Hygiene. This exhibition will be held on the occasion of the meeting of the International Medical Congress of 1881, and will be opened from July 16th to August 13th. The exhibition will comprise everything that is of service for the prevention, detection, cure, and alleviation of disease, and will be divided into three sections. *Medical Section.*—Surgical instruments and apparatus. —Appliances of the ward and sick-room.—Drugs, disinfectants, medical dietetic articles, and mineral waters.—Electrical instruments and appliances.—Microscopes and optical apparatus.—Apparatus of other kinds used in the investigation of disease.—Appliances used for the treatment of sick and wounded during war; street ambulances, etc. — Appliances used in teaching medicine. — Books, diagrams, models, etc. *Sanitary Section.*—Domestic and hospital architecture.—Planning, construction, decorative materials.—Ventilation, lighting, and warming. — Water-closets, sinks, baths, etc.—Sewerage and drainage.— Water supply and filtration.—Health resorts and sanitaria. — Books, diagrams, models, etc. *Miscellaneous Section.* — Applications of hygienic principles to food and dietaries, clothing, etc.—School furniture and other articles more or less connected with the general purpose of the exhibition. The exhibition will be held at South Kensington, space having been granted for it by the Royal Commissioners for the exhibition of 1851. Certificates of merit will be awarded to exhibitors. New inventions exhibited will be protected under a certificate from the Board of Trade. Exhibitors will be charged for space, and it is hoped that the exhibition, in this and other ways, will be made to pay its expenses. An undertaking of this magnitude, however, is not without risk, and although upward of £800 has been subscribed as a guarantee fund, the Committee hope to receive such additional contributions as will enable them to carry out their work thoroughly. A list of the guarantors will be published in th catalogue.

Army Intelligence. —*Official List of Changes of Stations and Duties of Officers of the Medical Department, United States Army, from May 14, 1881, to June 13, 1881.*—Keeney, C. C., Lieutenant-Colonel and Surgeon. When relieved by Surgeon Bailey, to await orders at San Francisco, California. S. O. 112, C. S., A. G. O. ═══ Bailey, E. I., Lieutenant-Colonel and Surgeon. To report in person to the Commanding General, Military Division of the Pacific and Department of California, for assignment to duty as Medical Director of the Department of California, relieving Surgeon Keeney. S. O. 112, A. G. O., May 16, 1881. So much of paragraph 1, S. O. 112, C. S., from A. G. O., as directs him to report to the Commanding General, Division of the Pacific, for duty as Medical Director of the Department of California, is revoked. S. O. 121, A. G. O., May 27, 1881. Having reported at Division Headquarters, in compliance with S. O. 112, paragraph 1, C. S., A. G. O., is assigned to duty in San Francisco as Attending Surgeon, relieving Surgeon C. C. Keeney. G. O. 10, Division of the Pacific and Department of California, May 31, 1881. ═══ McParlin, T. A., Lieutenant-Colonel and Assistant Medical Purveyor. When relieved by Surgeon Clements, to proceed to San Francisco, California, and assume charge of the Medical Purveying Department in that city, relieving Captain Henry Johnson, Medical Storekeeper. S. O. 112, C. S., A. G. O. ═══ Clements, B. A., Major and Surgeon. To be relieved from duty at Willet's Point, New York, June 1, 1881, to proceed to New York City, and assume the duties of Attending Surgeon there, relieving Lieutenant-Colonel McParlin. S. O. 112, C. S., A. G. O. ═══ Hartsuff, A., Major and Surgeon. To proceed to the Cantonment on the Uncompahgre, Colorado, and report for duty to Colonel Mackenzie, Fourth Cavalry, commanding. S. O. 113, Department of the Missouri, June 8, 1881. ═══ Billings, J. S., Major and Surgeon. To proceed to London, England, as a delegate to the International Medical Congress, to meet there August next. He will also visit, on public service, such points in Holland, Belgium, Germany, and elsewhere, as may be deemed necessary by the Surgeon General of the Army. S. O. 110, A. G. O., May 13, 1881. ═══ Tremaine, W. S., Captain and Assistant Surgeon. His leave of absence on account of sickness, granted him January 20, 1881, from this office, further extended six months on surgeon's certificate of disability. S. O. 112, A. G. O., May 16, 1881. ═══ Coues, E., Captain and Assistant Surgeon. Assigned to temporary duty as Post Surgeon at Fort Verde, Oregon Territory. S. O. 56, Department of Arizona, May 20, 1881. ═══ Meacham, F., Captain and Assistant Surgeon. Relieved from duty at Fort Hamilton and assigned to duty as Post Surgeon, Fort Wadsworth, New York Harbor, relieving Assistant Surgeon Burton. S. O. 90, Department of the East, May 20, 1881. ═══ Patzki, J. H., Captain and Assistant Surgeon. When relieved by Assistant Surgeon Cunningham, to proceed to St. Augustine, Florida, and relieve Assistant Surgeon Gardner from duty as Post Surgeon. S. O. 45, C. S., Department of the South. ═══ Corson, J. K., Captain and Assistant Surgeon. Granted leave of absence for one month, with permission to apply for two months' extension. S. O. 61, Department of Arizona, May 31, 1881. ═══ Heizmann, C. L., Captain and Assistant Surgeon. The telegraphic instructions of 22d inst. to Commanding Officer, Fort Townsend, Wyoming Territory, directing Assistant Surgeon Heizmann to report at these headquarters, confirmed. S. O. 71, Department of the Columbia, May 23, 1881. ═══ Woodruff, E., Captain and Assistant Surgeon—now awaiting orders in New York City. To report to Commanding Officer, Willet's Point, New York, to relieve Surgeon Clements. S. O. 116, A. G. O., May 21, 1881. ═══ Ainsworth, F. C., Captain and Assistant Surgeon. Relieved from temporary duty at Post of San Antonio, Texas, and assigned to duty at Fort Clark, Texas. S. O. 76, Department of Texas, May 31, 1881. ═══ Shufeldt, R. W., First Lieutenant and Assistant Surgeon. Assigned to temporary duty in the Surgeon General's office. S. O. 129, A. G. O., June 7, 1881. ═══ Cuningham, T. A., First Lieutenant and Assistant Surgeon. Assigned to duty at Jackson Barracks, Louisiana. S. O. 45, Department of the South, May 14, 1881. ═══ Perley, H. O., First Lieutenant and Assistant Surgeon. Relieved from duty in Department of Dakota, and to comply with S. O. 104, C. S., A. G. O. S. O. 97, Department of Dakota, June 6, 1881. ═══ Burton, H. G., First Lieutenant and Assistant Surgeon. Assigned to temporary duty at Fort Hamilton, New York Harbor. S. O. 90, Department of the East, May 20, 1881. ═══ Brechemin, L., First Lieutenant and Assistant Surgeon. Relieved from duty at Fort Meade, Dakota Territory, and assigned to duty at Fort Yates, Dakota Territory. S. O. 84, Department of Dakota, May 10, 1881. ═══ Powell, J. L., First Lieutenant and Assistant Surgeon. Relieved from duty with Company "A," Twenty-second Infantry, on arrival at Fort Concho, then to proceed to Fort Stockton, Texas, and report to Post Commander for duty as Post Surgeon. S. O. 76, C. S., Department of Texas. ═══ Benham, R. B., First Lieutenant and Assistant Surgeon. Relieved from duty at Fort A. Lincoln, Dakota Territory, and assigned to duty at Fort Assiniboine, Montana Territory. S. O. 97, Department of Dakota, June 6, 1881. ═══ Worthington, J. C., Captain and Assistant Surgeon. Assigned to duty at Fort Wayne, Michigan. S. O. 86, Department of the East, May 14, 1881. ═══ Shannon, W. C., Captain and Assistant Surgeon. Assigned to duty at Fort D. A. Russell, Wyoming Territory. S. O. 44, Department of the Platte, May 21, 1881.

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THE PHYSIOLOGICAL AND THERAPEUTICAL ACTION OF ERGOT.*

By ETIENNE EVETZKY, M. D.

> *L'ergot de seigle est un médicament dont on n'a certainement pas encore tiré tout le parti qu'on en doit attendre.*—"Bull. Gén. de Thérap.," xxxiii, 1847, p. 163.

PART I.—ERGOT.

Synonyms; History; Botany; Description; Microscopic Structure; Varieties of Ergot; Production, Collection, and Commerce; Preservation; Detection; Chemical Composition.

SYNONYMS.—Ergota† (U. S. and Br. Ph.), ergot, ergot of rye, spurred rye, cockspur rye, etc.; *Fr.:* ergot, ergot de blé, ergot de seigle, seigle ergoté, etc.; *Ger.:* Mutterkorn, Ergot.

HISTORY.‡—Undoubtedly our first knowledge of the medicinal virtues of ergot was obtained at the price of numerous epidemics of ergotism which visited Europe in the early ages after seasons of rain and scarcity. The information we have in relation to the earliest epidemics permits us only to assume that they were ergot disease. But as to later ones, beginning with the tenth century, we can positively identify the usual forms of ergot poisoning in the description given. Dangerous properties of ergot became known quite early. According to Mézeray, Sigebert de Gremblour pointed out, in 1096, the connection of epidemics with the abundant presence of ergot in rye. It is impossible to indicate at what period ergot began to be used for medicinal purposes. The earliest references show that some of its virtues were known already to the masses, and that it was used extensively in obstetric practice. Such a statement is made by Adam Lonicer, of Frankfort, who lived toward the middle of the sixteenth century. In 1576 the Medical Academy of Marburg attributed to this substance a spasmodic disease which then prevailed in Hesse. Johannes Thalius (1588) speaks of it as used "ad sistendum sanguinem." Camerarius (1688) refers to its use by German midwives. In 1693 the English botanist Ray described some of its medicinal properties. In France, according to Borden, it was used from time immemorial to increase uterine action. Barlurdini, Laneri, and Amaretti state that it was used in difficult labor. Parmentier (1774) refers to the same with regard to Alsace.

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* The Joseph Mather Smith Prize Essay for 1881.

† In French, *ergot* signifies cockspur.

‡ Stillé, "Therapeutics and Materia Medica," vol. ii, p. 717, Phila.; S. Wright, "Edinburgh Med. and Surg. Jour.," lii, p. 293, liii, p. 1.

In the course of the eighteenth century allusions to ergot are met with more frequently. It was used mainly among the lower classes, but still more extensively by charlatans, with criminal intent. This led to its use being interdicted in France in the year 1774. Toward the close of the last century, although still favorably indorsed by some physicians, it lost almost entirely the little reputation it had had. But in the beginning of the present century, mainly by the efforts of the American physicians, it was again revived. Drs. Stearns (1807), Akerly, Prescott (1813), Chapman, Dewees (1817–1818), and Atlee (1821) largely contributed to turn the tide of professional opinion in its favor; but European physicians presented a considerable opposition, Chaussier and Madame La Chapelle being most prominent in combating the idea of its efficiency. The contributions of Bogeschi, Davis, Michell, Villeneuve, and others finally resulted in removing the opprobrium attached to it.

Ergot was admitted into the London Pharmacopœia in 1836. Then a thorough study of its physiological action was entered upon, and as the work progressed the field of the therapeutic usefulness of ergot was extended; but the latter did not keep pace with the former, and, even at the present day, although we possess the essential knowledge of its physiological action, we greatly underestimate its therapeutic value.

The physiological action of a drug gives us a very imperfect insight into its capabilities at the bedside. The vital processes are so modified and combined in disease that frequently conditions are created permitting the drug to produce results which we would not have suspected otherwise. This establishes a certain independence, really an apparent one, in the aspects of the drug's physiological and therapeutical actions. We know that a moderate dose of opium has an imperceptible action on the sensation of a healthy individual, but that a much smaller dose will relieve severe pain. Its action on healthy nutrition is essentially injurious, but, if administered to a person whose constitution is suffering severely from lack of rest and from pain, it will act very beneficially. Ergot's action on the normal spleen is very slight, but the enlarged organ yields to it readily, and this fact opens a very promising field in the treatment of infectious diseases by ergot. At times we may even obtain results opposite to those we would naturally expect. Uterine congestion may cause abortion; ergot, by removing this condition, can at times prevent an accident which we would suppose it would hasten. These instances show how greatly we can increase the therapeutic potency of a drug if we are only conscious of all the morbid conditions before us; and there is no agent which can surpass ergot in this respect. I have made an effort at collecting all reports within my reach of the therapeutic uses of ergot, and I hope the reader, after looking them over, will be induced to recur to it more often than he did before; and in this he will be encouraged by the fact of the daily increasing use of ergot by the profession in general.

BOTANY.*—Ergot is the second stage in the evolution of a biennial fungus, named by Tulasne (1853) *claviceps purpurea*. This middle stage forms the sclerotium which occurs in a large number of the most various fungi, and is a special state of rest of these plants. Almost all our knowledge of the subject is due to the researches of Tulasne. This fungus usually infects rye, but all the graminaceæ are apt to suffer from it, also the cyperaceæ, and, perhaps, the palmaceæ. Although rainy seasons are most favorable for its development, dampness is not absolutely necessary. The formation of ergot takes place only in a few, usually from three to twelve, caryopsides in an ear, but more may be diseased. The first sign of ergot development is the appearance of the so-called honey-dew of rye—a yellowish mucus having an intensely sweet taste and the peculiar disagreeable odor often belonging to fungi. These drops attract ants and beetles, which have been supposed to be instrumental in the development of ergot. The honey-dew substance, treated with oxide of copper, shows the presence of sugar, which is probably the result of the decomposition of starch by the fungus. Examined under the microscope, it is found to contain an immense number of conidia. The drops dry up in a few days, and the ergotized soft ovaries become covered with and penetrated by a white spongy tissue—the mycelium of the young fungus. It is made up of slender thread-like cells, the hyphæ, the outer layer of which consists of rapidly-diverging cells, the basidiæ. Ergot, in this primary or mycelium stage, was regarded as an independent fungus by Léveillé (1827), who named it sphacelia segetum.

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* F. A. Flückiger and D. Hanbury, "Pharmacographia," London, 1874, p. 672.

The second stage begins with the mycelium penetrating and enveloping the caryopsis, with the exception of the apex, and thereby preventing its further growth. At the base of the caryopsis there is formed, by tumefaction and gradual transverse separation of the thread cells of the mycelium, a more compact, kernel-like body (the future ergot), violet-black without, white within, which gradually but largely increases in size, and ultimately separates from the mycelium as the loose tissue of the latter dries up and shrinks after the completion of its function. By this growth the remains of the caryopsides, still recognizable by their hairs and by the rudiments of the style, become visible above the paleæ on the apex of the mature ergot, now projecting prominently from the ear. In the commercial drug the apex is usually broken off.

It is evident that, in the process of development just described, the tissue of the caryopsis of the rye does not undergo a transformation, but that it is completely destroyed; and the microscopic structure of the ergot does not exhibit any resemblance to a caryopsis or a seed. De Candolle (1816) considered the fungus complete, and named it sclerotium clavus; and Fries, spermœdia clavus.

Nothing further occurs in the ergot while it remains in the ear, but, laid on damp earth, after some months of rest in the succeeding spring, at certain points small orbicular patches of rind fold themselves back and throw out little white heads. They increase in size, assume a grayish-yellow color changing to purple, and finally, after some weeks, stretch themselves toward the light on slender, shining stalks of a pale violet color. The stalks often attain an inch in length, with a thickness of about half a line. After a short time there appears on the surface of the head a number of brownish warts, in which are the openings of minute cavities composed of a large number of sacs, each containing, as is usual in fungi, eight spores. The total number of spores in the twenty or thirty heads sometimes produced from a single ergot often exceeds a million. These heads represent the true fructification of the fungus, and they die in two or three weeks from the time of their appearance. This state of the plant appears to have been observed for the first time in 1801, by Schumacher, who called it sphœria; other names were given it, until Tulasne proved it to be the final stage of the development of ergot. The three different forms of this fungus—namely, the mycelium, the ergot, and the fruit-bearing heads—are, therefore, merely successive states of one and the same plant, the claviceps purpurea.

Description.—Ergot as found in commerce consists of fusiform grains. They are from one third to one and a half inches long, and from one half to four lines in diameter, subcylindrical or often obtusely triangular, tapering at both ends, usually somewhat curved, with three longitudinal furrows and an easily-detached, small, yellowish appendage or head at the apex, while the opposite extremity is somewhat rounded. The ergots are firm, horny, somewhat elastic, have a close fracture, are brittle when dry, yet difficult to pulverize. They are externally of a purplish-black color, the surface frequently fissured transversely; internally, whitish with purplish striæ, of a uniform texture. The tissue is imperfectly penetrable by water, even the thinnest sections swelling but slightly. It has a peculiar, unpleasant odor of spoiled fish, and a mawkish, oily, acrid taste.

Microscopic Structure.—Fully-developed ergot consists of uniformly densely-felted tissue of short, thread-like, somewhat thick-walled cells, which are irregularly packed and so intimately matted together that it is only by prolonged boiling of thin slices with potash and alternate treatment with acids and ether that the individual cells can be made evident, the aspect of which differs from that of the hyphæ of other fungi in being shorter, containing numerous drops of oil, but neither starch nor crystals; otherwise they are empty. Some of the cells of the outermost rows are of a violet color, and their walls are thicker.

Varieties of Ergot.—The foregoing description applies to the ergot of rye, but the fungus can attack other plants, producing ergot similar in all essential points to the ergot of rye. *Ergot of wheat*, collected in some parts of France and Italy, differs from the latter, being shorter, thicker, harder, and having a less disagreeable odor. It is more easily preserved; medicinally it is similar to rye ergot. According to Carbonneaux Le Perdriel, it is free from some of the unpleasant effects peculiar to rye ergot. Mialhe and Grand Clement recommend it in preference to the latter, while Pouchet and Jobert pronounce them to be identical in their therapeutic effects. *Ergot of oats* is more slender than that of rye. *Ergot of* *maize*, according to Jobert, is identical in medicinal virtues with rye ergot. *Ergot of diss* (arundo ampelodesmos, Cirillo—a North African grass), according to Lallemant, is twice as strong as ordinary ergot. It is of the same internal structure, but longer and not so thick.

Production, Collection, and Commerce.—Ergot is found all over Europe, and also in this country, but not in as great quantities in all places. It is the most common in countries where agriculture is conducted on the most primitive principles. The ergot harvest is more abundant in damp, rainy years. The countries from which it is most largely exported are Russia, Spain, certain parts of Austria, Italy, and France. In the central parts of Europe ergot is so scarce that its collection is not profitable. The same may be said also of this country, as all the ergot used here is imported. According to Wood, the United States were entirely free from ergotism. It is found most extensively on the borders of the fields, where the wind carries the spores more readily. Honey-dew drops are inactive, and are collected in Russia by the children and eaten by them with relish.

Ergot must be gathered from the ear a little before the harvest, and if picked too early it is entirely inactive, or is very feeble. According to Bonjean, the active properties do not appear before the sixth day. Besides, the strength of ergot varies with the crop and the locality.

The consumption of ergot is rapidly increasing. In England during 1839 the importation of ergot was one and a half tons; the wholesale price of it during 1825–'28 varied from twenty-six to fifty shillings a pound. The importation of ergot into this country during 1876–'77 was ten times greater than during 1866–'67. How rapidly it increased can be seen from the following table, kindly furnished me by J. Nimmo, Jr., Chief of the Bureau of Statistics, Treasury Department. It gives the quantity, value, and average cost by the pound of ergot imported into the United States during the fiscal years ending June 30, 1870–'79, inclusive.

YEAR ENDING JUNE 30.	Pounds.	Value.	Average Cost a Pound.
1870	16,177	$6,723·18	41·0 cents.
1871	17,804·5	6,898	38·0 "
1872	29,480	10,094	34·0 "
1873	45,347	11,784	26·0 "
1874	31,304	4,561	14·5 "
1875	60,620	10,878	17·9 "
1876	42,599	15,192	35·6 "
1877	75,550	47,738	63·0 "
1878	63,804	14,797	22·7 "
1879	81,503	16,126	19·8 "

Preservation.—Ergot is a substance very hard to keep. The fixed oils forming an important constituent of it become rancid with the free access of air. It is also apt to be attacked by an insect—a mite of the genus trombidium. Ergot is more readily deteriorated in the form of powder; but, if closely shut up in dry bottles, it can be kept for a considerable time. A little cotton soaked in chloroform, or a bit of camphor, will protect it from the insect. Viel * recommends pulverizing the ergot with sugar. Ducroc † advises placing on ergot some powdered wood charcoal (oak or pine). Still, the strength of ergot is uncertain if it is more then a year old.

Detection of Ergot.—Although, according to Bonjean, ergot loses its poisonous properties to a considerable extent if taken in bread, still this is the only means of poisoning, except when taken for medicinal purposes. The peculiar color and odor of flour and bread (according to Orfila, the latter has dark, violet-colored spots) are usually sufficient to reveal its presence. But, if its amount is not great, chemical manipulations will be required for its detection. The test of Winkler is old and unreliable, because, according to Dragendorff, caustic potassa generates trimethylamine with other substances also. It consists in mixing the suspected substance with the solution of KHO; this is heated, and a peculiar penetrating odor of herring is generated, indicating that ergot is present in a larger amount than 1·5 per cent. The test of Zinin,‡ improved by Jacobi, is more reliable and delicate. The flour is repeatedly boiled with alcohol; it is filtered, and a little cold alcohol, previously acidulated with sulphuric acid, is added. The presence of ergot will be demonstrated by the appearance in a few minutes on the upper layer of fluid of a beautiful rose color, by the intensity of which we may judge with a certain degree of accuracy of the quantity of ergot. According to the report of the commission appointed by the Russian government in 1864, flour containing but one per cent. of ergot produces very dangerous symptoms, and the amount of it is frequently much greater. In the epidemic reported by Swjatlowsky # the flour contained seven per cent. of ergot.

Chemical Composition.—From the fact that ergot is but an agglomeration of fungi, low organizations, it is natural to assume that its composition will be complicated and not very stable. This is the reason why the chemists have had so much difficulty in deter-

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* "Am. Jour. of the Med. Sci.," 1852, p. 556.

† "New Remedies," 1875, p. 156.

‡ Dybkowsky, "Lectzii Pharmacologii," Kiew, 1873, p. 612.

"Vratsch.," 1880, Nos. 10 and 11.

mining its component parts; and, although we possess at present a pretty accurate idea of its composition, still there are some uncertainties for future examiners to determine.

The ingredients composing ergot may be divided into the active and the indifferent. To the latter belongs a *fatty substance*—a yellowish, bland, non-drying fixed oil. Its specific gravity is 0·925. With soda and potash it is easily saponified. It is composed of oleine, 69·2 per cent.; palmatine, 22·7 per cent.; glycerides, 8 per cent.; and a small amount of volatile fatty acids. The decomposition of ergot is due to the oxidation of this fatty substance, and after the oil is extracted ergot is more readily preserved. If obtained by expression, it is free from any poisonous or irritating properties, but, if extracted with ether, it is irritating and poisonous, on account of the presence of *resin* and active principles of ergot.

Fat forms about 30 per cent. of the crude drug. *Cholesterine* is found in it at times, but it may be wanting. If present, it is always in a small amount—about 0·036 per cent. It was first noticed by Stahl (1865), but its nature was defined by Schoonbroodt (1866), and Ludwig (1869). Its presence was also confirmed by Ganzer.

Mycose is found in ergot, one part in 1,000. It crystallizes in rhomboid prisms, and melts at a high temperature, giving off a decided odor of caramel. It is not as sweet as cane sugar, and polarizes light to the right three times more than the latter. Its formula is $C^{12}H^{22}O^{11}+2H^{2}O$.

Lactic acid and its salts were found in ergot by Schoonbroodt in 1866. Buchheim and others believe they are derived from the mycose by the action of the ferment of ergot upon the latter.

Fungus cellulose, or fungine, differs from the ordinary cellulose in the fact that the usual reactions with iodine and sulphuric acid are wanting.

Mannite was found by Mitscherlich, Fiedler, and Ludwig, in place of mycose.

Leucine was found by Buchheim, but he is not certain if this substance is a normal constituent of ergot or an artificial product.

Methylamine, according to Ludwig, is a normal component part of ergot, but its presence is denied by Manassewitz and Ganzer, while Tanret thinks that it is derived from the decomposition of his ergotinine.

Trimethylamine is obtained by heating ergot with any caustic alkali, when its characteristic odor is evolved, serving for the detection of ergot. It was first described by Winkler. The general opinion in regard to these two substances, and also *ammoniacal salts*, is that they are the products of decomposition.

Formic and *acetic acids* are also found in ergot.

Albuminoid substances are present to the extent of 3·09 per cent., according to Thielon, and 3·2 per cent., according to Ganzer.

The following mineral substances have been found in the ashes of ergot: *Phosphoric acid* (13·25–50·5 per cent.), *potash* (18–39 per cent.), *soda* (0·65–14 per cent.), *lime* (1·25–1·50 per cent.), *manganese* (2–4·75 per cent.), *oxide of iron* (0·70–2 per cent.), *silica* (2·5–14·5 per cent.). Some have also found *aluminia* (0·3–0·6 per cent.), *oxide of manganese* (0·25–4 per cent.), *oxide of copper* (0·5 per cent.), *sulphuric acid* (0·02 per cent.), *chlorine* (2–2·5 per cent.), *carbon* (12·1–12·6 per cent.), *chloride of sodium* (0·6–1·5 per cent.).

According to Buchheim, there is no *starch* in ergot, although its presence was claimed by Schröder and Legrip. The same authority denies the existence of *gum* and *vegetable mucine*. The coloring matter was first spoken of by Sage, in 1776. According to Dragendorff and Podwissotzky, it is composed of two substances, both intimately connected with lime—sclererythrine and sclerojodine.

Sclererythrine is extracted from ergot by a solution of tartaric acid. It is not soluble in water, but is soluble in alcohol, in ether, in chloroform, and, particularly, in caustic potash, ammonia, etc. The solution of sclererythrine in an alkali has a beautiful murexide color; with sulphate of aluminium and chloride of zinc, the alcoholic solution assumes a red color. With the salts of borium, calcium, and many heavy metals, it gives a blue precipitate. Sclererythrine stands in a near relation to chrysophanic acid and alizarine. Its quantity in the mature ergot varies from 1 to 2 parts in 100,000. It is not an entirely inert substance.

Sclerojodine is obtained at the same time with the preceding. It is not soluble in water, alcohol, ether, or chloroform. With potash it assumes a beautiful violet color, from which it can be precipitated by acetic acid. Concentrated sulphuric acid dissolves sclerojodine, assuming a blue-violet tint; thence its name. Sclerojodine is found in ergot in the proportion of 1 to 1,000. It has also slight active properties resembling those of the preceding.

Dragendorff and Podwissotzky found in ergot two crystallizable substances—*sclero-crystalline* and *sclero-xanthine*, both perfectly inert. The first presents itself as almost colorless needles, insoluble in water, alcohol, or ether, but soluble in caustic potash and ammonia. The probable formula is $C^{10}H^{10}C^{4}$. The second is the hydrate of the first, and appears as yellow crystals. Its probable formula is $2C^{10}H^{10}O^4+3H^2O$.

The above-named ingredients form the bulk of the crude drug, but do not determine its specific effects, which are produced by the substances to be spoken of presently.

The attention of the profession was called to the active principles of ergot by Wiggers,[*] in 1830, when he described his ergotine—a substance of brownish color, slightly soluble in alcohol, but not in water or ether. He obtained it by first extracting the fats by means of ether, then heating the residue with alcohol, and evaporating it, when it was washed repeatedly with water. In 1842 Bonjean[†] presented his extract, which differed in some respects from the former, being an aqueous instead of an alcoholic extract. He treated the powder first with water, to which he added half its weight of alcohol to precipitate certain ingredients held in solution; this was then filtered and evaporated. Bonjean's extract is officinal in many continental pharmacopœias under the name of *extractum ergotæ*, s. *secalis cornuti.*

In 1864 Wenzell[‡] stated that the active properties of ergot were due to two alkaloids—*ergotine* and *ecboline*, and a crystallizable volatile acid—*ergotic acid*, with which they were combined. These alkaloids differed from each other in many respects. Ecboline was precipitable by corrosive sublimate, and acted mainly on the brain and muscles; while ergotine could be precipitated by phosphomolybdic acid, was less active, and affected mainly the circulation. Both were brownish, had a bitter taste, were uncrystallizable, soluble in water, alcohol, and ether. Manassewitz[#] confirmed the presence of ergotine, whose formula he defined as $C^{50}H^{52}N^2O^3$, finding it in the proportion of 0·12 per cent. But he could not find either ecboline or ergotic acid. In 1870 Ganzer[‖] and Hermann[^] confirmed the analyses of Wenzell. Ecboline, according to Ganzer, was found in the proportion of 0·16 per cent., and ergotine in that of 0·04 per cent. He obtained also hydrochlorate of ergotine, crystallizable in needles. In 1871 Haudelin[◊] stated also that the active properties of ergot were due to an alkaloid. In 1872 Wenzell[↧] described a modification of his process. In 1874 Buchheim[↕] proved that

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[*] "Ann. der Pharmakol.," i, p. 129.

[†] "Comptes Rendus," xiv, p. 899.

[‡] "Am. Jour. of Pharm.," 1864, p. 193.

[#] "Pharm. Ztschr. f. Russland," 1867, p. 387.

[‖] "Arch. f. Pharm.," etc., cxciv, p. 195.

[^] "Viertelj. f. prakt. Pharm.," xviii, pp. 4, 81.

[◊] "Einige Beiträge zur Kenntniss des Mutterkornes," Diss., Dorpat.

[↧] "Arch. f. Pharm.," etc., cc, p. 256.

[↕] "Arch. f. exp. Pathol. u. Pharm.," iii, p. 1.

Wenzell's alkaloids were not alkaloids, and, moreover, were not pure compounds, and, as an active ingredient, he pronounced a substance similar to Wiggers's ergotine—a dark, colloid substance, very hygroscopic, and of acid reaction. The same year Wernich * stated that the active principle of ergot was an acid soluble in water, but not in absolute alcohol. Zweifel † thought that the active principle of ergot must be an alkaloid, but that Wenzell's alkaloids were not the ingredients, because after they were percipitated by tannic acid and corrosive sublimate the solution still contained some active properties. Tanret, ‡ in 1875, extracted from the fixed oil of ergot, treated with ether and acidulated water, an alkaloid which he called ergotinine. It is crystallizable at first, but soon becomes resinous. One kilogramme of fresh ergot yielded but 1·20 grammes of the alkaloid, and only one third of this was in the form of crystals. Its formula is $C^{35}H^{40}N^{4}O^{6}$.

It is apparent from the foregoing that some only succeeded in partially isolating the active ingredients, while others were led astray by almost insurmountable difficulties in separating them, and obtained only artificial complex compounds. From the latest works (Buchheim, Wernich, Zweifel, and others) it is evident that more appropriate methods have been adopted, as their results correspond more closely with those of Dragendorff and Podwissotzky, # who gave us a positive knowledge of the active ingredients of ergot. They are sclerotic acid and scleromucine.

Scleromucine is a slimy, colloid substance, soluble in water and precipitable by forty- to forty-five-per-cent. alcohol. It is darker than sclerotic acid, slightly hygroscopic, inodorous, and tasteless. It is not a glucoside, an albuminoid, or an alkaloid substance. It contains nitrogen. When once dried it dissolves in water with the greatest difficulty. It is precipitable by tannic acid and phosphomolybdic acid. Scleromucine is found in the crude drug to the amount of two to three per cent. Dragendorff and Podwissotzky do not recommend its use, on account of its slight solubility in water when once dried.

Sclerotic acid is also a colloid substance, has marked acid properties, is soluble in water, forty-five-per-cent. cold alcohol, and seventy-five-per-cent. boiling alcohol. It is precipitable by eighty-five-

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* "Einige Versuchsreihen über d. Mutterkorn," Berlin, 1874.

† "Arch. f. exper. Pathol. u. Pharm.," 1875, p. 387.

‡ "New Remedies," 1878, p. 206; "Répertoire de Pharm.," 31^{me} année, n. s., iii, p. 708.

"Pharmac. Jour. and Trans.," 1876, p. 1,001; "Arch. f. exp. Pathol. u. Pharm.," vi, p. 153.

to ninety-per-cent. alcohol, in combination with lime mainly, also potash, soda, silica, and manganese. It is of a yellowish-brown color, has no taste or smell, is slightly hygroscopic without being deliquescent. It does not possess any properties indicating it to be an alkaloid, except that it is precipitable by phospho-molybdic acid in the form of a yellow, and by tannic acid in the form of a colorless, mass. It can not be grouped with either albuminoid or glucosidal compounds. The qualitative and quantitative analytical methods are the same for both. Sclerotic acid is a compound of 3 to 4 per cent. of ash, 40 per cent. of carbon, 5·2 per cent. of hydrogen, 4·2 per cent. of nitrogen, and 50·6 per cent. of oxygen. Its formula is $C^{12} H^{19} NO^{9}$ or $C^{12} H^{19} NO^{10}$.

Sclerotic acid is found in ergot in the proportion of 3 to 4 parts in 100. Subcutaneous injections of 0·02 to 0·04 gramme produce gradually in frogs a state of complete palsy lasting from six to seven days. By its properties it is unusually well adapted for therapeutical uses. The dose for man is from 0·04 to 0·05 gramme. Dragendorff and Podwissotzky claim that it does not irritate the cellular tissue. Nikitine,* who experimented considerably with sclerotic acid, states that the injections are painful, but that they do not produce any local inflammation. He finds that sclerotate of soda is less active than the acid itself, and he also recommends the acid for therapeutical uses, as it possesses all the virtues of the crude drug.

In connection with this subject I may state that Levy,† on the basis of a few experiments (on three bitches and two pregnant women), recently asserted that the specific effects of ergot were due to the presence in it of phosphoric acid, which, according to him, acts like ergot in the conditions indicating the use of the latter. He states that the strength of ergot is in proportion to the phosphoric acid it contains.

The method of obtaining sclerotic acid and scleromucine adopted by Dragendorff and Podwissotzky is as follows: Powdered ergot is treated first with ether and absolute alcohol; then it is digested with water, and the solution is dialysed. The dialysate is afterward evaporated to a sirupy consistence, and a sufficient quantity of alcohol is added to it to bring its strength to 40 to 45 per cent.; this precipitates phosphates. Then more alcohol is added to raise its strength to 75 to 80 per cent., which will precipitate the salts of sclerotic acid, as they are not soluble in alcohol of this strength. The precipitated salts are purified by repeated washing in alcohol of this strength, and are redissolved in 45-per-cent. alcohol. At this stage the salts give 19 per cent. of ash. For the purpose of separating the acid from the bases, hydrochloric acid is added to the solution, and, to isolate sclerotic acid again, absolute alcohol is added. Now the acid gives only 3 per cent. of ash, composed mainly of silica, manganese, phosphate of iron, and potassium. The dark liquid remaining on the dialyser, when mixed with sufficient alcohol to bring its strength to 45 to 60 per cent., yields scleromucine as a precipitate.

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* Rossbach's "Pharmak. Untersuch.," iii; "London Med. Record," March, 1879.

† "Am. Jour. of the Med. Sci.," 1876, p. 266.

(*To be continued.*)

THE CORPUSCULAR ELEMENTS OF THE BLOOD; THEIR ANATOMY AND PHYSIOLOGY, NORMAL AND PATHOLOGICAL.

By ALEXANDER DUANE, M. D.

(*Continued from July Number.*)

Chemical Composition.—The erythrocytes contain about forty-three per cent. of solid matter. Of this a small fraction is made up of mineral salts, chiefly those of potassium along with sodium phosphate. The rest is organic matter, of which hæmoglobin forms ninety per cent., while ten per cent. is constituted by paraglobulin, lecithin, cholesterin, etc.

Of these components by far the most important is the hæmoglobin. Upon its presence depends the continuance of the functional activity of the corpuscle. More than this, the capacity of the corpuscle as an oxygen-carrier is directly proportional to the amount of hæmoglobin which it contains. And it needs but a short process of physiological integration to show that what is true of each corpuscular element must be true of the blood as a whole, and that the value of the latter as an agent in respiration is measured by its richness in this one constituent. It becomes a matter of considerable interest, therefore, to discover the physical and chemical properties of this body, as well as the influence of different agents in altering these properties; and we may be pardoned if we discuss the subject in considerable detail.

Hæmoglobin, as it occurs in the corpuscles, is uniformly diffused throughout their substance. It is prevented from dissolving in the surrounding serum, either by the nature of its combination with the stroma, or, more probably, by the composition of the serum itself. In fact, a great variety of agents, which produce an alteration in the latter, will discharge this coloring matter from its cellular connection. This process can be imitated artificially, and the hæmoglobin may thus be extracted for purposes of study. When thus obtained, it appears under the form of characteristically scarlet crystals, which vary in shape in the different animals. In human blood these crystals are usually difficult of demonstration; but, by the use of pyrogallic acid (Wedl *) or by taking blood drawn by a leech (Blanchard †), they may be procured more readily, and, after exposure to the vapor of osmic acid, may be preserved indefinitely in glycerine. They are soluble in water, in dilute alcohol, and in solutions of albumen and of the alkaline phosphates. The solution is of the same brilliant red hue as the hæmoglobin itself, and gives with the spectroscope two absorption-bands which are characteristic, and which, accordingly, furnish a perfectly reliable and also very delicate test for the presence of blood.

The chemical composition of the hæmoglobin is complicated. In general terms, it may be said to consist of a crystalline body, hæmatin, united with a proteid, globin (Preyer). This hæmatin is remarkable among the organic elements of the body for containing iron. It was, indeed, thought at one time that it was the latter constituent which gave the blood its scarlet color. This idea, however, is discountenanced by the results of spectrum analysis. It is a general rule that the absorption spectra of salts of the same metal show a strong family resemblance (Stokes),‡ but the spectrum of hæmoglobin is altogether unlike that of the iron salts. Moreover, Malden and Van Gandoever # have been able to extract the iron entirely without loss of the red tint. It is, therefore, believed that the color of the blood is due, not so much to any one of its constituents as to the specific way in which these constituents are combined. The hæmoglobin, when of this bright arterial tint, and when presenting the double absorption-band, referred to above, is in a condition of loose chemical combination with a certain amount of extra oxygen, and is hence called oxy-hæmoglobin. When this extra oxygen is given off, or, in chemical language, when the hæmoglobin is reduced, the color changes to a dark purple, and the two absorption-bands are replaced by one.

This is the process which is taking place continually in the capillaries during life. So the difference between arterial and venous blood is due, in part at least, to the difference in the amount of oxygen held by the hæmoglobin; and the respiratory changes in

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* "Arch. f. path. Anat. u. Physiol. u. f. klin. Med.," Bd. lxxx, 1880, p. 171.

† "Progr. Méd.," 1880, p. 49.

‡ Balfour Stewart, "Heat," 1871, p. 236.

"Popular Science Monthly," vol. i, p. 767.

the blood consist chiefly in the reception of an additional quantum of oxygen by the hæmoglobin. And it is the facility with which the hæmoglobin becomes alternately oxidized and reduced that constitutes its value as an agent in respiration. Evidently the efficiency of such an agent may be impaired by any substance which displaces the hæmoglobin and combines with its extra oxygen, or which expels the oxygen and forms a stable compound with the hæmoglobin itself. Such substances are the respiratory poisons. Those which act in the first way are nitrogen monoxide and sulphureted hydrogen; those acting in the second way are carbon monoxide, nitrogen dioxide, and possibly others among the gases, and hydrocyanic acid. In addition to this, it is found that an entire abolition of the power of carrying oxygen is brought to pass when the hæmatin is deprived of its iron. The latter element, therefore, although forming less than $\frac{1}{200}$ of the whole mass of hæmoglobin, is its essential constituent in the performance of the great function which it subserves.*

Besides the hæmatin, there are two other varieties of crystals usually spoken of in connection with the blood. One is the so-called hæmin crystals, which are really composed of chloride of hæmatin, and are prepared by adding to dried blood a little glacial acetic acid and some common salt, and then heating. They have lately been made the subject of investigation by Morache,† who finds that, however prepared, or from whatever source derived, they always present the same form. The second variety is the hæmatoidin crystals, which are found in old blood-clots. They do not contain iron, and are believed to be identical in composition with the coloring matter of the bile. As illustrating the physiological interest attaching to the last statement, it may be noted in passing that all the normal and pathological pigments found in the body are considered to owe their existence to hæmoglobin.

The quantity of hæmoglobin amounts to 125 grammes in every kilogramme of blood. It is thus seen to constitute a little over one per cent. of the body weight. The total amount of iron, however, which, as we have seen, is the important element in carrying on the respiratory process, is only 3·75 grammes, or about 50 grains.

The corpuscular richness in hæmoglobin may be estimated as varying between 25 and 30 $\mu\mu$gm.;‡ if we accept Welcker's estimate of the size of an erythrocyte, this will give about ·4 of a $\mu\mu$gm. for each cubic μ of corpuscular substance. This quantity is relatively greatest at birth, and least between the ages of six months and five years; from this point it increases gradually till middle life, and then again suffers a progressive diminution.* In females it is from five to seven per cent. less abundant than in males. From experiments made by Tizzoni and Fileti,† it would seem that its production is greatly diminished if the animal examined is kept in total darkness. It has also been found to vary considerably in pathological states, and that without reference to the number of corpuscles. Thus, in three cases reported by Mrs. Hart,‡ in which the number of corpuscles was the same in all, the percentage of hæmoglobin varied from six to thirteen, and the clinical condition ranged from that of health to that of marked anæmia.

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* A great part of this paragraph has been condensed from Foster, "Text-Book of Physiology," 1880.

† "Ann. d'Hygiène Publique," January, 1881.

‡ A $\mu\mu$gm. = a micromilligramme, is the weight of a cubic μ of distilled water, and represents the 1,000,000,000 part of a milligramme.

Such an absence of relation between the number of red cells and the amount of hæmoglobin renders it necessary to have some ready means of estimating the latter for clinical purposes. Various instruments have been devised for this purpose. The process is called hæmochrometry, and depends either upon a comparison of the tint of the blood with a standard of color, or upon the absorptive power for light displayed by a layer of known thickness. The former principle is applied by Hoppe-Seyler, who dilutes a given quantity of the specimen with a variable amount of water, until it just equals in tint a standard solution of hæmoglobin; by Worm-Müller, who adds a variable quantity of the test solution to a fixed amount of water, before comparing; by Quincke,# who uses, as a standard of comparison, a set of tubes of the same size and containing colored fluids in different degrees of dilution; by Hayem,‖ who examines the specimen by reflected light, and compares it with a series of color-plates. Some observers, finding the standard solution of hæmoglobin difficult to preserve, have substituted for it a graduated solution of carmine, which seems to answer the purpose quite as well. Of those who employ the second principle, Preyer measures the absorptive power by means of the spectroscope; Vierordt determines it by comparison with that of different thicknesses of a hæmoglobin solution; Malassez ^ uses a hollow prism filled with the fluid to be examined, together with a straight tube containing the standard solution, and notes the thickness of the layer in the former which gives the same tint as the latter; Bizzozero * incloses the test-fluid in a tube, whose length can be varied at will, and through which, as through a telescope, a ray of light is made to pass from a lamp-flame to the eye of the observer, the length of the tube being altered till the flame assumes a standard tint; Mantagezza † uses a tube of fixed length, and interposes between the eye and the flame a succession of colored glasses until the light is quenched. By any one of these different ways the amount of hæmoglobin may be measured with tolerable precision.

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* Blanchard, "Progr. Méd.," 1880, p. 49; Fenoglio, "Sperimentale," 1880, p. 449.

† "Gazz. Med. Ital. Lombard.," 1881, 3.

‡ "Quart. Jour. of Microsc. Sci.," January, 1881.

# "Berl. klin. Woch.," 1878, No. 32.

‖ "Arch. de Physiol.," 1877, p. 946.

^ *Ibid.*, 1877, p. 1.

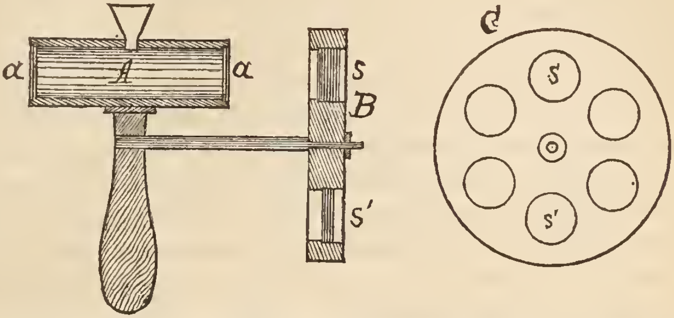

Fig. 6.—Mantagezza's Globulimeter.

A, tube for holding test-fluid, closed by glass plates, *a*, *a*; B, revolving wheel, pierced with holes *s*, *s′*, which contain from one to thirty thin plates of colored glass; C, front view of B.

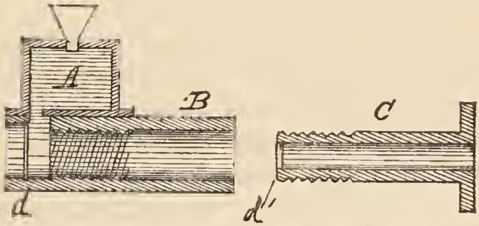

Fig. 7.—Bizzozero's Chromocytometer.

A, reservoir containing the fluid to be tested; B, external tube, whose cavity communicates with A; C, internal tube, screwing into B; *d*, *d′*, glass plates, closing the orifices of B and C. The distance between *d* and *d′* is measured by a screw micrometer, not shown in the cut.

Returning, after this long digression, to the subject of the general chemistry of the blood cells, we may pass over that of the white corpuscles with very brief mention. Of course, these bodies occur in far too small a quantity to be made a subject of analysis. Judging, however, from the composition of pus cells, to which they are so closely allied in physical characters, they consist ‡ of several proteid substances united with lecithin, glycogen, and mineral salts, chiefly those of potash.

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* "Med. Jahrbücher," 1880, p. 251.

† "Berl. klin. Woch.," 1878, No. 14.

‡ Miescher, quoted by Foster, "Text-Book of Physiology."

Behavior after Removal from the Body.—One of the most striking phenomena exhibited by the red blood corpuscles, when left to themselves, is their characteristic property of arranging themselves into rouleaux (nummulation). When viewed in this condition, a number of them will be found adhering by their flat surfaces, and forming a long row like a pile of coin. This arrangement is found to exist in defibrinated blood, and is also observed in the fluid blood left in the veins after death, and even in the vessels of the living animal. From these facts, and from other considerations, it is clear that this adhesion is not due to connecting bands of coagulated fibrin, as Dogiel supposed, but rather to processes springing from the corpuscles themselves, and consisting of the same material as they.* Nummulation is said to be least marked in blood taken from the hepatic vein.

Erythrocytes in a concentrated menstruum assume a prickly or crenated appearance. This has been regarded by some as an evidence of morbid action, but is probably, in nearly every case, an artificial production. In cholera, however, it does appear to take place in the blood itself; being due here to the great loss of water from the blood and the consequent increase in the density of that fluid.

As the red corpuscles are swept about in little streams under the microscope, they are seen to be very flexible and elastic. They will bend upon themselves to avoid obstacles, and they will become twisted and assume various shapes to pass through a narrow channel; yet, the path once cleared, they resume their original form instantly. In the words of a French physiologist, they are eminently "malleable and ductile." A far different property has been assigned to them recently—that of contractility and amœboid movement. Quite an extensive list of advocates of this doctrine is cited by Dowdeswell,† who has himself seen the erythrocytes sending off processes which afterward became detached and exhibited amœboid movement. To obtain this phenomenon, the corpuscles must be examined at the temperature of the body. Various reagents assist in bringing out this appearance, such as urea and ammonia, sherry wine, etc. Elsberg,‡ of New York, obtained evidences of contractility by treating his preparations with a saturated solution of bichromate of potassium.

Gaule # has made the remarkable observation that in frogs' blood an elongated worm-like body may be seen to wriggle out from the body of the corpuscle and pass in a spiral course over the field of view. Arndt,* who has also observed this phenomenon, suggests that the so-called spirochætæ of relapsing fever are some such projectiles emitted from the erythrocytes; and his hypothesis receives some support from the remark of Dowdeswell that many of these detached processes are indistinguishable from micrococci and bacteria. These observations appear well established as isolated facts; yet it would seem unsafe to establish any general principle upon them. It is, indeed, believed, and apparently on good grounds, that the embryonic erythrocytes are capable both of amœboid movement and of division; but that such a definite and stable anatomical element as the adult erythrocyte should have the same property, is contrary to the generally accepted teaching of histology. At the same time, it is not denied that such a process may occur as a pathological phenomenon.

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* Weber and Suchard, "Arch. de Physiol.," t. vii, 1880, p. 521.

† "Quart. Jour. of Microsc. Sci.," January, 1881.

‡ "Med. Record," April 5, 1879.

# "Arch. f. Anat. u. Phys.," i, 2, 1880.

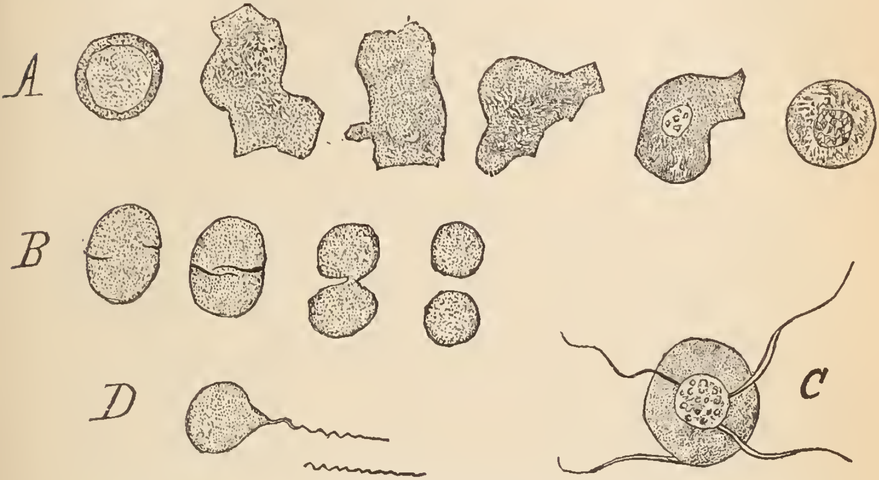

FIG. 8. (After Arndt.)
A, successive phases in the amœboid changes of shape in a red corpuscle; B, division of a red corpuscle; C, Gaule's worm-shaped processes; D, development of a "Spirochæta Obermeierii."

With the white corpuscles the case is different. Unlike the erythrocytes, they consist largely of protoplasmic substance, which, here as elsewhere, seems to be the one material suitable for the generation of amœboid movement and spontaneous contractility. Hence they may be seen, not only to present a series of successively varied shapes, but also to divide into parts, each of which exhibits the life and activity of the parent cell. These phenomena can readily be demonstrated on the warm stage or in the vessels of the living animal. In the white corpuscles this property of amœboid activity is important in explaining the power of diapedesis which these bodies possess, and their capability of proliferation when outside of the vessels. It also explains how the leucocytes can include foreign bodies, little granules, or masses of pigment within their own substance, forming, in the last instance, the so-called "hæmoglobin-holding" cells. This power of taking up extraneous substances is thought to be of use in removing the effete red corpuscles (Quincke), and in withdrawing the hæmatin from old extravasations.* Again, the rarely-observed nucleated red corpuscle is believed by some to be nothing but a "hæmoglobin-holding" white cell.

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* "Arch. f. path. Anat. u. Physiol. u. f. klin. Med.," January, 1881.

After the corpuscles have remained for some time outside the vessels, they lose their vital activity and enter into a condition of cadaveric rigidity, a sort of corpuscular rigor mortis. In this state they remain a long time without change, especially if preserved from moisture. Finally they break down. The hæmoglobin is converted into hæmatin or hæmatoidin, the proteid constituents disintegrate, the glycogen in the leucocytes is converted into sugar (Foster.) A similar death and decomposition of the corpuscles take place in the blood of one animal when injected into the veins of another, although the time required for the completion of the process varies with the animal experimented on.

Effect of Reagents.—Very many substances produce alterations in the blood cells, both within and without the body. Many of these changes come more properly under the head of "Therapeusis of the Blood Cells," and their consideration, therefore, will be deferred for the present, only those which follow immediately upon the application of the reagents being given here. In brief, these effects may be stated thus: Water,† acetic and other acids, dilute alkalies, biliary salts, chloroform, pyrogallic acid, carbon dioxide, and arseniureted hydrogen act destructively upon the red corpuscles and cause the discharge of their hæmoglobin. They act in this way if injected into the blood, and so produce "hæmatogenous" jaundice and hæmoglobinuria. The absence of corpuscles in the hepatic capillaries is supposed to be due to the solvent action of the biliary matters exerted after death (Cornil and Ranvier). Concentrated alkalies, on the other hand, tend to preserve the corpuscles. Carbolic acid causes the erythrocytes to shrink and become irregular and folded, or to swell up and suffer internal disintegration. Quinine is thought to have an affinity for the oxygen of the hæmoglobin, and is said to alter the shape of the red corpuscle; but this is doubtful. Corrosive sublimate is used to demonstrate a nucleus in the red cells, and is also said to prevent the occurrence of amœboid movement in these bodies (Addison, 1861). The white cells are more resistant to most of these reagents; in general, when exposed to their action, they swell up, lose their granular appearance, and show their nuclei clearly. Quinine, alcohol, hydrocyanic acid, and carbolic acid* tend to check the amœboid movements of the leucocytes. The first of these agents is thought by some to exert its influence directly upon the protoplasm of the cells. It appears, also, when applied in pretty large quantity, to give the leucocytes a dark, granular appearance.† Carbolic acid produces a similar effect.‡

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* Cornil and Ranvier, "Pathological Histology," 1880, p. 250.

† Valentin has noticed that when blood is diluted the index of refraction decreases; but at a certain point it begins suddenly to increase. This occurs, he thinks, at the moment when the red globules are dissolved.

Coloring matters of various kinds have been employed in examining the blood cells, the white corpuscles, as a rule, taking up all pigments readily, the red corpuscles being tinged by eosine, iodine, etc. Ehrlich's classification of leucocytes on the basis of their affinity for different kinds of coloring matters has already been mentioned. It is hardly worth while to describe it here, especially as some of his distinctions have been invalidated (Pouchet).

Physical agents exert a powerful influence upon the blood corpuscles. Heat, if moderate in degree, excites into action or accelerates amœboid movement in the white corpuscles, and, according to some, in the red ones also. If, however, the temperature exceeds 52° C. [125·6° F.], the red corpuscles are seen to break into pieces and to fly in different directions over the stage.# Cold checks the amœboid movements, and, according to both Schmidt and Hayem, if applied to blood immediately on its withdrawal from the body, will prevent the disintegration of the transition forms and the elementary erythrocytes which exist in the vessels during life. If, however, the temperature is carried below the freezing point, the red corpuscles will break up and their hæmoglobin will be discharged (see Fig. 2). The belief that Hayem and Schmidt's observations are to be explained by the latter phenomenon has already been alluded to. A galvanic current, sent through a mass of blood, causes accumulation of the corpuscles at one pole and their solution at the other.*

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* Schtschepotjew, "Arch. f. Physiol.," 1879, Bd. xix, p. 53.

† Appert, "Arch. f. path. Anat. u. Physiol. u. f. klin. Med.," Bd. lxxi, p. 364.

‡ Prudden, "Am. Jour. of the Med. Sci.," 1881, p. 82.

# Schultze, "Arch. f. mikrosk. Anat.," 1865.

The degree of resistance to reagents varies somewhat with the individual cell, with its age, and the presence or absence of morbid conditions.

CHARACTERS IN THE BLOOD-STREAM.—In the living frog, the vessels may be observed under the microscope in the web of the foot, the mesentery, and the tongue. They have also been examined in the lip and in the penis of man. The appearances presented are very striking. The erythrocytes, in masses or in single file, occupying always the central core of the vessel, are hurried along, rolling and tumbling over one another as they go, and, if momentarily detained, soon break loose and are swept on again. The leucocytes, on the contrary, vastly fewer in number, move sluggishly enough, and at times even remain stationary; moreover, they hug the walls of the vessel, being contained in the peripheral part of the capillary bore, or Poiseul's space, as it is called. This position which they assume is supposed to be due to their superior lightness, as experiments made upon fluids circulating in capillary tubes demonstrate that the lighter particles seek the external portion, while the heavier ones are driven along in the center. The sluggishness of movement of the white corpuscles is evidently due to the great friction existing in the peripheral space.

In the blood-stream the corpuscles exhibit the same properties as when removed from the vessels. The red cells are as elastic and flexible, the white cells as capable of amœboid movement and of division. The latter fact is especially prominent in conditions of inflammation, when the leucocytes, by virtue of this power of active movement, and assisted by the accumulation of cells and the retardation of the blood-stream, escape from the vessels. When this occurs, something of the following nature is observed to take place: A corpuscle becomes stationary, and adheres to the wall of the vessel; soon it changes its shape, and sends out a pointed process; this sinks into the vascular wall, and gradually draws into itself the remainder of the cell. Directly afterward a portion of the cell is seen projecting outside the vessel; this portion gradually enlarges at the expense of the part within the vessel until, by a continuance of the process, the entire cell is extruded.

This is the process of diapedesis, which has of late years attracted so much attention. First mentioned by Döllinger (1819), it was more fully described by Addison, who, furthermore, considered the white corpuscles to be the source of pus cells. Such views, however, met with little favor at the time, and most of Addison's theories were scouted by his contemporaries.* But, under Cohnheim, the observations of Addison have been repeated and his hypotheses reaffirmed; and for the German pathologist the migration of the white corpuscles forms the basis of a great theory of inflammation. Diapedesis may, however, occur without inflammation; thus, in leucocythæmia the obstruction produced by the great excess of blood cells causes some of the latter to be expressed into the surrounding tissues; and in œdema, when the pressure reaches a certain point, there is always diapedesis. Under all these circumstances there is a simultaneous but much less marked escape of red corpuscles. The latter sometimes assume an hour-glass shape as they pass through the vascular walls (Cohnheim); and when outside the vessels they are often seen to be constricted, mammilated, or in fragments (Cornil and Ranvier). This process is supposed to be a physiological one for both the red and the white corpuscles, and has been called in to explain the occasional appearance of the former in the lymphatics and the occurrence of the latter in various extra-vascular situations.

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* Satterthwaite, "Arch. of Comp. Med. and Surg.," April, 1880.

Corpuscles in Other Situations.—To the significance of the occasional presence of erythrocytes in the lymph and chyle we shall return when speaking of the origin of these bodies. The white corpuscles also occur in these fluids. Moreover, the bodies found in semen and colostrum, as well as the wandering connective-tissue cells, are regarded as identical organisms. All, therefore, are included under the name of leucocytes, which also embraces such pathological formations as pus cells and mucus corpuscles. But the consideration of the latter, as well as of the appearance of the blood cells in abnormal situations, must be reserved till a later time.

Blood cells of both kinds are found in the interior of the so-called cytogenous organs—the spleen and the bone-marrow. The interspaces of all adenoid tissues are filled up with leucocytes. Both these facts have a bearing on the problem of the origin of blood cells. Besides this, the white corpuscles appear to suffer extravasation normally wherever the blood-current is retarded, as in the brain.† This diapedesis is, of course, insignificant compared with that which occurs in the pathological retardation due to œdema or inflammation.

Function.—The erythrocytes contain a large amount of hæmoglobin, held, so to speak, in suspension; and they prevent its solution in the different fluids of the body. They are thus efficient in enabling this substance to fulfill its respiratory functions in the lungs and in the tissues. The details of the process of oxygenation and reduction have already been given in describing hæmoglobin. It is only necessary to add here that the shape of the erythrocytes is such as to offer a large extent of surface to the action of a gas, and is thus very well adapted to the end which they subserve. This surface becomes considerable if the total number of corpuscles is taken into account. Indeed, if the whole quantity of blood be estimated at five cubic decimetres, the aggregate corpuscular area amounts to two thousand square metres, or not far from half an acre. If, as Kölliker (quoted by Dalton) supposes, the total mass of erythrocytes in a given space is nearly the same in all animals, a little mathematical consideration will show that the total areas of surface exposed are inversely as the diameters of the corpuscles. In other words, the animal which has the smallest corpuscles presents the largest surface for gaseous diffusion and for oxygenation. It is, perhaps, because of this fact that the general rule holds good, which was pointed out by Milne-Edwards,* that the vital and physical activity of an animal is inversely proportional to the size of its blood corpuscle.

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* See the review of his article, in the "Am. Jour. of the Med. Sci.," October, 1849.

† Babière, "Jour. de Méd., Chir., et Pharm.," Bruxelles, 1880, p. 117.

The function of the red cells and the way in which it is carried on are so well understood, that the vague guesses formerly put forth can be of interest only as scientific curiosities. Of such a nature was the idea of Jones,† that the corpuscles formed an immense gland which elaborated the constituents of the blood. Again, Rees ‡ supposed that the corpuscles in the venous blood contained phosphorized fat; that this compound, on coming into contact with oxygen, was decomposed into carbon dioxide and water, which were exhaled, and into phosphoric acid, which united with the alkali of the liquor sanguinis to form phosphate of sodium; and that the latter salt acted upon the coloring matter so as to produce the bright red tint of arterial blood. Hétet # ascribed the function of carrying oxygen, not to the hæmoglobin, but to alkaline sulphocyanides which he supposed to exist in the blood.

The office of the white corpuscles is quite conjectural. They are thought by Schmidt to contain fibrin-ferment, and so to be instrumental in causing coagulation. They are also said to be the

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* In Flint's "Text-Book of Physiology," 1879, p. 8.

† "Am. Jour. of the Med. Sci.," July, 1856.

‡ "Brit. and For. Med.-Chir. Rev.," January, 1848.

Ibid., July, 1855.

source of the red cells, and appear to act a very important part in carrying on the process of repair.

The hæmatoblasts, if we follow Hayem, not only form new red corpuscles, but are also instrumental in producing coagulation. In this connection, and as a fact tending to substantiate our previously announced view of the nature of hæmatoblasts, we may note that hæmoglobin, when discharged from the corpuscles and dissolved in the surrounding blood, is much more active in furthering coagulation than when the corpuscles remain entire.*

ORIGIN.—Like every other living organism, the blood cells have a limited term of existence; they are born and they die. This fact, agreeing as it does with all our conceptions of life and its workings, seems scarcely to need demonstration. Yet it has been subjected to experimental proof. Some, for instance, have adduced the progressive increase in the number of corpuscles which makes good the loss caused by severe hæmorrhage. Others have injected the blood of one animal into the veins of another, and, being able to trace the foreign corpuscles by the difference in their form, have observed their gradual disappearance, and have inferred that the same fate overtakes them when in their native circulation. Again, it is asserted that the great variations in relative number which occur in the same individual must be due, in part at least, to changes in the absolute quantity of corpuscles; and the fact that blood cells are met with in forms indicating different degrees of development is regarded as an additional proof that they suffer progressive changes of growth and decay.

But, while it seems evident enough that the corpuscles are being constantly produced and destroyed, it is by no means so clear how and where these processes of birth and death are carried on. In fact, physiologists are not at all agreed upon this matter, and several theories, more or less contradictory of each other, are at present in vogue. Since these conflicting opinions are held by equally trustworthy observers, we must conclude that the data are as yet insufficient for the complete solution of the problem. Nevertheless, we believe that the present state of our knowledge warrants the formation of a provisional hypothesis which will possess a considerable degree of probability. To do this, however, requires a careful review of the facts on which such an hypothesis must be based, together with a comparison of the different existing theories and an investigation of the arguments alleged in their support. This is the plan which we shall endeavor to carry out in the following pages. That we may follow the logical order as nearly as possible, we will first consider the primary development of the corpuscles in the fœtus; next, the character of the organs to which a blood-elaborating function has been assigned; and, lastly, the results of physiological experiment and clinical observation, as far as they bear upon the question.

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* Sachssendahl, "Centralbl. f. d. med. Wissensch.," 1881, No. 3.

CORPUSCLES IN THE EMBRYO.—Traces of the vascular system appear during the third week of fœtal life, soon after the formation of the mesoblastic layer. Certain cells of this layer arrange themselves in rows, and so form tubes which afterward become blood-vessels. Other cells increase by endogenous multiplication of their nuclei, and divide to form erythrocytes which are larger and paler* than in the adult, and are generally nucleated. Once formed, the primitive corpuscles may generate others by fission. This fact has been confirmed by several observers.† Schäfer‡ has indicated a third mode of origin, viz., by substitution of hæmoglobin for the protoplasm of undifferentiated connective-tissue cells. Creighton# confirms the truth of this statement, and relates several cases of new growths which are curious instances of a pathological reversion to the embryonal process, the indifferent cells constituting the tumor developing in this way into regularly-formed blood corpuscles.

The white corpuscles appear at about the same time as the red, and are doubtless derived, like them, from the proliferation of the embryonic cells.

As fœtal development goes on, the primitive erythrocytes, which are pale and have large nuclei, are gradually replaced by darker cells with small nuclei.‖ In many erythrocytes also the nucleus disappears altogether, either by bodily escape from the cell, or more probably by intra-cellular disintegration.^ In this way are formed bodies apparently identical with the ordinary non-nucleated erythrocytes. Whether the latter, which appear at this time in great numbers, and which by the end of the fourth month have entirely replaced the primitive corpuscles, are all formed by this process is

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* Paget says that they are deeper in color than the adult corpuscle; but no other author, we believe, agrees with him in this.

† See those quoted by Cathcart, "Med. Record," xvii, 1880, and Bizzozero, in "Sperimentale," Nov., 1880, p. 464.

‡ "Proc. of the Roy. Soc.," 1874, p. 273.

"Jour. of Anat. and Phys.," xiv, 1879–1880, p. 293.

‖ Fellner, "Med. Jahrb.," 1880, 4.

^ Fellner says that the escape of the nucleus from the cell, such as Rindfleisch has described, occurs only in blood which has been subjected some time to post-mortem changes.

not known. It seems probable, however, that they have other methods of origin. They are said by Foster * to be mainly derived from newly-formed leucocytes, developed, most probably, in the liver and the spleen. Foà and Salvioli † are of the opinion that the red corpuscles at this period of life are formed out of giant cells, found principally in the liver and to a less extent in the spleen, the bone-marrow, and the lymphatic glands. However this may be, it is clear that in early fœtal life the development of the blood corpuscles takes place entirely by cell proliferation. In later intra-uterine life and after birth the process must be a different one. The body is no longer made up of unstable, proliferating cells, but of differentiated, stable tissues and organs. The red corpuscles themselves have changed their character, and no longer multiply by division. Under these changed conditions, the blood cells must originate ultimately either by a spontaneous aggregation of particles in the blood plasma itself or by cellular activity in some of the solid tissues. Each mode of development has its advocates, although the latter is the more generally accepted. Again, some think that the white and the red corpuscles represent different stages in the life of the same cell, while others hold that they are of altogether independent formation. And, lastly, there are many who believe that the process of cell elaboration, however performed, is carried on in certain definite organs, which have hence been called *cytogenetic* (= "cell-producing") or, less appropriately, *hæmatopoiëtic* (= "blood-making").

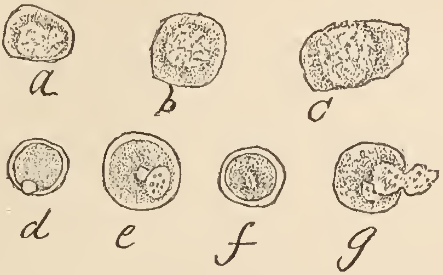

FIG. 9.—CORPUSCLES IN THE EMBRYO. (After Fellner).
a, b, c, Primitive pale corpuscles with large nuclei ; d, e, f, Dark small nucleated corpuscles, developed later. They present the intra-cellular body of Stricker, with its concentric envelope ; g, Corpuscle from which nucleus is just escaping.

CYTOGENOUS ORGANS.—Under this head have been classed all the organs formed of adenoid tissue, such as the lymphatic glands, the lymphatic structures of the alimentary canal, and the spleen; and, in addition to these, the liver and the red marrow of the bones. In some of these localities, likewise, it is thought that the destruction of the corpuscles is accomplished, so that the processes of birth and death may go on at the same time in the same organs.

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* "Text-Book of Physiology," 1880, p. 36.

† "Arch. per le Sci. Med.," iv, 1880, p. 1.

It may be asked if there are any *a priori* reasons for attributing a special common function to such dissimilar organs. One that immediately suggests itself is that, while their universal distribution and their collective size point to some important part which they play in the animal economy, no reasonable explanation of their function has been offered, except in the case of the liver, and possibly the spleen. Again, their vascularity, far in excess of their nutritive requirements, favors the idea that the superfluous blood is sent into them to undergo some changes in its constitution. From this point of view these organs are quite analogous to the equally vascular lungs and kidneys; only the changes which they effect in the blood are thought to be structural instead of chemical. Of course, generalizations like these prove little, unless supplemented by the evidences derived from the microscope and from experiment. Hence a more particular account * of the histological characters of each of these organs will now be given.

The *lymphatic glands* contain as their essential elements the follicles. These consist of a fine reticulum, inclosing in its meshes a great number of closely-packed, small, round cells. The reticulum itself is nothing but a mass of connective-tissue cells, united together by branching processes and presenting nuclei at various points (adenoid tissue). The inclosed lymphoid cells have large nuclei, and resemble small white blood corpuscles. The follicle lies free in an open space, the lymph sinus, and is kept in place by a number of reticular fibrils which attach it to trabeculæ of connective tissue derived from the capsule of the organ. The lymph sinus, which opens directly into a lymphatic vessel, also contains lymphoid cells; these are distinguished from those of the follicle by the readiness with which they can be washed away when a stream of water is made to flow through the gland.

The *lymphatic follicles*, which include certain structures in the tonsil, tongue, and pharynx, as well as the solitary and agminate glands of the intestine, are of essentially the same plan of formation as the lymphatic glands. They are follicular depressions, traversed by a fine network of adenoid tissue, which incloses numerous closely-packed leucocytes, and they are in intimate relations with the lymphatic channels. It must be remembered that these follicles are in no sense a part of the mucous membrane in which they are imbedded, but are projections of the connective-tissue coat lying immediately beneath. They are thus, both in form and in continuity of structure, members of the connective-tissue group of tissues.

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* Derived, to a great extent, from Orth, "Cursus der normalen Histologie," 1878.

The *thymus gland* is also made up of adenoid elements, and resembles the lymphatic glands in structure.

The *spleen* may be regarded histologically as a very large and complex lymphatic gland, in which the lymph passages have been replaced by blood-vessels. The glandular follicle is represented by the Malpighian corpuscle, the lymph sinus by the more open reticular space surrounding the corpuscle, and the cellular packing by the spleen pulp. The peculiarities which distinguish the spleen are the absence of lymphatics, the character of the cells, and the disposition of the vessels. The cellular elements are red and white corpuscles, and large, colorless, characteristic pulp cells. The latter are often fatty, and may contain in their interior masses of pigment or even intact erythrocytes. This fact, although doubted by some of the older observers, seems now sufficiently well established. Nucleated red corpuscles are also said to have been found in the spleen, especially in pathological conditions. Besides cells, the spleen pulp presents peculiar proteids containing iron, together with pigmentary matters rich in carbon.* These are regarded as derivatives of hæmoglobin, although quite distinct from it in character. The arrangement of vessels in the spleen is peculiar. The arteries, in their course, pass through the Malpighian corpuscles. These latter, according to the results of studies in comparative anatomy, are to be considered as expansions of the arterial sheath, which at this spot breaks up into an adenoid tissue. The arteries, arriving at their termination, divide abruptly into a number of small, radiating branches. These are supposed by some to unite with the veins, either immediately or through the intervention of capillaries; by others, to empty directly into the reticular open spaces of the spleen. The veins are remarkable for the excessive thinness of their walls, which are made up of little more than a single layer of very characteristic sickle-shaped cells. On this account, and because of their size and abundance, they form a sort of cavernous tissue in the circum-corpuscular spaces. It will thus be seen that there is only a very slight barrier between the blood in the splenic vessels and the open spaces in which the cells of the pulp are packed. The disposition, too, is such as to retard the current as much as possible, and allow time for the passage of substances into or from the blood.

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* Foster, *op. cit.*, p. 446; Malassez and Picard.

The *red marrow of bone*, which within the last fifteen years has assumed prominence as a cytogenetic tissue, is made up mainly of cells. These present a great variety of forms; yet observers are tolerably agreed as to their character. They include red and white blood corpuscles, "hæmatoblasts," medulla cells, myeloplaxes, masses of pigment, and stellate fat cells.* The hæmatoblasts, which must not be confounded with those described by Hayem, are nucleated cells, homogeneous or finely granular in appearance, and more or less tinged with hæmoglobin. Various forms of these are observed, all of which taken together constitute an unbroken series, the last member of which is the red blood corpuscle. Among these "transition forms" are found nucleated red corpuscles; and a still more advanced stage of development is recognized, in which the nucleus is absent and the cell differs from an erythrocyte in shape alone. At the other end of the series are found the small colorless "proto-leucocytes" of Obrastzow,† which consist of little else besides a nucleus.

These facts, even if they do not demonstrate directly the formation of red corpuscles in the marrow, are yet evidences of great formative activity of some kind. This is further shown by the circumstance that all the transition forms have been observed in the act of dividing to form new cells. The medulla cells proper are very like those found in the spleen pulp, and are large, round, granular bodies, with a great vesicular nucleus. These cells increase by division, according to Rindfleisch, although this is denied by Obrastzow. They do, however, exhibit amœboid movement, and have the further property of uniting to form large compound cells. The "myeloplaxes," or giant cells, are probably formed by some such process of fusion. These are large, irregular masses of protoplasm containing many nuclei, and are thought to represent stages of a degenerative process, the last step of which is found in the amorphous masses of granules scattered through the marrow. Some, however, believe that they are cells in a state of active proliferation, and, in this case, they furnish another proof of the activity of the formative processes in the marrow. The stellate cells (cells of the basement substance) are nucleated, and form a reticulum by the union of their branching processes.‡ It is in the nodal points of this reticulum that fat is first deposited, when the red marrow is changed into the ordinary yellow variety.

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* Orth; Cornil and Ranvier; Rindfleisch; Obrastzow.

† "Arch. f. path. Anat. u. Physiol. u. f. klin. Med.," lxxxiv, 2, 1881.

‡ Rindfleisch, "Arch. f. mikrosk. Anat.," Aug., 1879.

The red marrow, then, consists of a mass of disconnected cellular elements inclosed in a network of interlacing cells; in other words, it is built up on essentially the same plan as the spleen and lymphatic glands. This conception of its structure finds some confirmation in a discovery recently made by Capon.* This author has found that the fibers of Sharpey, which form a sort of fibrous stroma for the bone, penetrate the Haversian canals and attach themselves to the wall of the nutrient vessel. The interlacing fibrillæ, crossing the cavity of the Haversian canal, render it very like a lymph sinus; and, as in the latter case, the reticulum is ultimately derived from the capsule of the lymphatic gland, so here it springs, in great part at least, from the periosteum enveloping the bone.

Besides these cellular elements, the red marrow contains, like the spleen and liver, iron in the form of an albuminate.† This is regarded as the decomposition product of effete red corpuscles, and also as a possible source for the formation of new ones.

The vessels of the marrow are very numerous, and, as Rindfleisch and others have shown, are unprovided with a proper wall separating them from the surrounding tissue.

A comparison of the data above presented gives the following as the general anatomical features common to all the cytogenous organs:

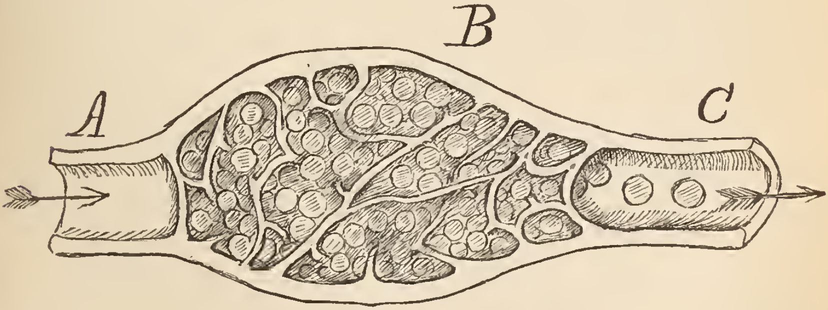

FIG. 10.—DIAGRAM OF A CYTOGENOUS ORGAN.
A, afferent vessel, containing few corpuscular elements; B, cytogenous organ, formed by expansion of the vascular sheath. Shows the reticulum, formed of connective-tissue cells, inclosing numerous cellular elements; C, efferent vessel, rich in corpuscular elements which have been washed away from the interspaces of B.

1. Formation more or less closely upon a single type of tissue—the adenoid;

2. Accumulation within the adenoid reticulum of cells, which are

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* "Gazz. Med. Ital., Prov. Ven.," Dec. 4, 11, 1880.

† Quincke, "Dtsch. Arch. f. klin. Med.," Nov., 1880.

either identical with the corpuscular elements of the blood, or present embryonic forms of these elements in all stages of growth;

3. Evidences of active and constant cell proliferation, carried on in these organs, and affecting the connective-tissue reticulum as well as the contained cells;

4. A disposition of the vessels or lymph passages such as to bring a very great surface of circulating fluid into contact with the masses of cells;

5. Arrangement of the structure so as to favor the retardation of the circulating fluid;

6. Delicacy of the vascular walls, allowing free communication between the circulating fluid and the circumvascular spaces.

Physiological Data.—Having learned thus much from anatomy alone, we may now see what physiology can teach us. The most valuable information that we can gain in this way is that derived from the determination of the changes which the lymph or blood experiences in passing through a cytogenous organ. Accordingly, a brief summary of what we know upon this point will form the next topic of consideration.

The *lymph* contains many white corpuscles, indistinguishable from those of the blood, and a number of minute granules, probably fatty in character. The presence of red corpuscles is rather doubtful, some asserting that whenever found they are always the result of the dissection. They have, however, been seen in the mesenteric lacteals of the living animal (Wagner*). According to this and other observers, they enter the lacteals from the outside, being derived either from extravasated blood or from matters contained in the intestinal canal. As evidence for the latter mode of formation, von Wittich† showed that the injection of blood into the cœcum was followed by the appearance of corpuscles in the neighboring lacteals. Foster,‡ however, believes that the lymph normally contains immature red corpuscles, and this idea receives some support from the observation of Quevenne and Gubler,# who found in the fluid taken from varicose lymphatics spheroidal red cells 3 to 6 or 8 μ in diameter. Further, Hayem describes his hæmatoblasts as originating in the lymph, being first contained in the interior of the white corpuscles and afterward being extruded by the amœboid contraction of the latter. It is interesting to note that Foà and Salvioli found somewhat similar hæmatoblasts in the lymphatic glands themselves during intra-uterine life. But the important

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* Götting. "Gesellsch. d. Wissensch.," 1856.

† Quoted in "Arch f. path. Anat. u. Physiol. u. f. klin. Med.," xi, 1857, p. 100.

‡ *Op. cit.*, p. 317.

"Gaz. Méd.," 1854, No. 24.

fact, physiologically speaking, in regard to the lymph is that its corpuscular elements increase in number and in size as they approach the blood. Moreover, this increase is found to take place just after the lymph has passed through a lymphatic gland. Since now, the lymphatic glands contain cells identical with lymph corpuscles, and since a portion of these cells can readily be detached from the surrounding reticulum by gentle irrigation, the conclusion seems inevitable that the lymph derives its cells, in part at least, from the glands through which it passes.

Where, then, do the glands obtain their supply? Cohnheim believes that it is from the blood-vessels themselves, which deposit their corpuscles in the lymphatic reticulum. In this view, the blood would be constantly receiving material which it had previously discharged, and there would be neither gain nor loss in the number of leucocytes formed. But, although this explanation may be true in part, it seems hardly sufficient to account for so great an accumulation of cells. Moreover, the lymphoid elements in the gland have been observed in a state of active proliferation (Ranvier); so that another mode of origin must be allowed, and one which would produce an increase in the absolute number of cells contained in the blood. An objection has been raised to both the sources of supply here indicated, in that lymph which has passed through no lymphatic glands does contain some corpuscles, although they are few in number. But such lymph, it must be remembered, usually comes from some other adenoid structures, the follicles of the alimentary canal, for instance; and these, from their analogy in other respects to the lymphatic glands, should have a similar office in the formation of leucocytes.

Blood which has passed through the *spleen* experiences important modifications. Thus, that taken from the splenic vein shows a great increase in the number of white corpuscles and in the amount of free pigment matter. These phenomena, although some* have failed to notice them, are conceded to exist by the majority of physiologists. More doubtful is the relation of red corpuscles, some maintaining that they are increased, others that they are markedly diminished, in blood which has passed through the spleen. It is, indeed, probable that a change may take place in either direction; and this, if true, would indicate the simultaneous existence in the spleen of two opposite processes, which nearly balance one another, and of which sometimes one preponderates, sometimes the other.

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* Tarchanoff and Swaen, "Arch. f. path. Anat. u. Physiol. u. f. klin. Med.," 1875, p. 324; Schiff.

The blood of the splenic vein has been also found to contain corpuscle-holding cells, but the rarity of this occurrence deprives it of much physiological significance.

The results of splenotomy tend to confirm the theory just advanced as to the balanced action of the spleen in the formation and destruction of erythrocytes. Thus, Tizzoni and Fileti * observed, after removal of the organ, a primary increase in the hæmoglobin of the blood (effect of abolition of the corpuscle-destroying function); this was succeeded by a large decrease in the hæmoglobin (effect of the abolition of the corpuscle-forming function); and this, in turn, gave place to a slow increase in the hæmoglobin to or above the normal, indicating a compensatory action in some other organ. In this case, the compensatory changes were found in the marrow of bones. An enlargement of the lymphatic glands, after removal of the spleen, has also been observed, † and is probably indicative of an effort to replace the defective formation of white corpuscles. In a case of removal of the spleen for leucocythæmia, the operation was followed by a marked increase in the number of white cells,‡ which may, however, have been due to the effect of hæmorrhage.

Changes in the splenic blood are also brought about by artificially induced alterations in the size of the organ. Thus, section of the splenic nerves, which produces hyperæmia and enlargement of the organ, causes a large increase in the number of white blood corpuscles.# Contraction of the spleen, on the other hand, has the opposite effect, except when it is induced after an enlargement of the organ. In the latter case the number of white corpuscles in the splenic vein is increased ‖—a result which might have been anticipated, as the first effect of a diminution in size must be to force some of the cells of the spleen pulp into the efferent vein.

In the *bone marrow* the direct connection of the cellular elements with the vessels is shown by the experiments of Bizzozero

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* "Rivist. Clinic. di Bologna," Sept., 1880.

† Führer and Ludwig, Vierordt's "Arch.," xiv, 1855; Hyrtl; Czermak; Tiedemann and Gmelin.

‡ Lyon, "Arch. f. path. Anat. u. Physiol. u. f. klin. Med.," lxxxiv, 2.

Tarchanoff, "Arch. f. Physiol.," 1874, p. 97. Bulgak says that enlargement of the spleen diminishes the number of white cells in the splenic vein, but whether he refers to a simple dilatation of the above-described character or not, we do not know. It is very probable that a pathological enlargement of the spleen would interfere with its functions and produce the result which he describes. In any case, his testimony agrees with Tarchanoff's as to the essential point in question, namely, that the spleen is a producer of leucocytes, the only doubt being as to whether enlargement of the organ heightens or impairs its efficiency in this regard.

‖ "Von Ziemssen's Cycl., American Supplement," Diseases of the Spleen.

and Torre,* in which an injection into the nutrient artery of the bone washed out these same elements with the stream issuing from the corresponding vein. Indeed, if we follow the description given by these authors, the process of cell formation takes place within the veins themselves. Such an hypothesis is, however, rendered unnecessary by the discovery that the medullary circulation, like the splenic, is discontinuous—a discovery to which allusion has already been made. Bizzozero, in another communication,† showed that in hibernating frogs, in which the marrow is chiefly of the fatty variety, the white cells of the blood are not half as numerous as in the same animal during the summer months, when the bones contain more of the red, or lymphoid, marrow.

The *liver* is supposed to act upon the corpuscles mainly on account of the differences observed between the blood of the portal and of the hepatic veins. In the latter are found a larger number of leucocytes in proportion to the red cells, with an absolute diminution of the latter, and an increased quantity of "elementary corpuscles." These last are considered to be fragments of the fully-formed erythrocytes. Such facts, taken in conjunction with the formation of biliary coloring matters which are apparently derived from hæmoglobin, make it probable that some of the erythrocytes are destroyed in passing through the liver. There seem to be no evidences of a simultaneous new formation of the red cells except during fœtal life. Eales,‡ to be sure, thought that such a process might be inferred from the fact that in the portal blood are seen withered, crenated cells, which disappear in the liver and are replaced in the hepatic vein by cells which are quite resistant to reagents and which are presumably young and vigorous. This fact, however, can be as well explained by supposing that none but the most hardy corpuscles can pass through the liver without destruction.

Whether the liver takes any part in forming the white corpuscles is doubtful. Removal of the organ, in frogs, appears to increase the relative number of white corpuscles,# which would rather indicate an opposite function. But this fact is hardly sufficient of itself to establish the existence of any physiological process, and, besides, it admits of various explanations.

In closing this sketch of the physiology of the cytogenous organs, we may add that they present different degrees of functional

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* "Centralbl. f. d. med. Wissensch.," 1880, 40.

† "Gazz. Med. Ital. Lombard.," Nov., 1868.

‡ Quoted by Cathcart, *loc. cit.*

Moleschott, Müller's "Arch.," 1853, 1.

activity at different periods of life. They seem to begin their blood-elaborating office as soon as they are formed in the fœtus. According to Foà and Salvioli,* the liver is very efficient at this time in the formation of erythrocytes, but its power diminishes with the increasing size of the viscus, and ceases altogether in the first month of extra-uterine life. In the spleen, on the contrary, the functional activity increases with the size of the organ and persists after birth. The same is true of the red marrow. The lymphatic glands, like the liver, are efficient for the production of erythrocytes during fœtal life only. Corpuscle-holding cells, indicating the existence of a cell-destroying process, are found in the spleen in the sixth month of fœtal life.

(*To be continued.*)

A REMARKABLE CASE OF LACERATION OF THE URETHRA, FOLLOWING DILATATION; CURED AFTER FOURTEEN OPERATIONS.

By ANDREW F. CURRIER, M. D.,
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I wish to put on record the history of a remarkable case, demonstrating at least two important truths—*first*, the susceptibility, I might almost say submissiveness, of the female bladder and urethra to surgical interference; *secondly*, the reward following patient and careful operations through a series of years. So far as I can ascertain, the literature of gynæcology furnishes no parallel case.

The patient is Miss Eliza C., aged 26, of Waverley, Pa. Her early history, as given by herself, is as follows: She was quite well during childhood until the age of twelve, with the exception of occasional irritation in micturition, which often caused her to retain the urine as long as possible. During her twelfth year she fell, and two days afterward began to menstruate. This function was accomplished regularly for the following six years; then stopped abruptly, being in abeyance for the succeeding four years. Pain existed every month during the latter period, but was unaccompanied by flowing. Medication of various sorts was kept up, but surgery was not resorted to previous to the time when she entered the Woman's Hospital, December 27, 1876. At the end of the four years, menstruation reappeared, and has since then continued with tolerable regularity.

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* *Loc. cit.*

When eighteen years of age she lost control of the bladder, this condition being intermittent for one year. When nineteen she lost control entirely, and two years later came to the hospital for relief.

The case is the same as that recorded in Dr. Skene's book on "Diseases of the Bladder and Urethra in Women," page 341. In concluding this history, Dr. S. says, on page 343: "Subsequently vaginal cystotomy was performed by Dr. Emmet, but without avail, and the patient, after months of ineffectual treatment, was finally discharged uncured."

At the present time this statement should be so amended as to read: the patient was eventually discharged entirely cured. For several months after her reception into the hospital the patient received treatment bearing upon her general condition, which was that of anæmia and neurasthenia; then dilatation of the urethra by the finger, or rapid dilatation, as it is sometimes called, was decided upon and subsequently accomplished, the result being laceration of the muscular fibers of that tube, and, what is quite phenomenal, complete inability to pass the urine. At the end of six months she was transferred to Dr. Emmet's service, with her trouble unrelieved. This was in the fall of 1877.

As to the advisability of this method of dilatation, it is not the object of this paper to discuss. Eminent authorities uphold the practice; but, with the greatest care and dexterity, serious accidents do result, and these may be avoided by following the method of Dr. Emmet, namely, making a short longitudinal incision in the base of the bladder, just posterior to the neck, the opportunities for investigation and diagnosis by this method being certainly equal, if not superior, to those furnished by any other means yet devised.

When Dr. Emmet took charge of the patient his first operation was the making an artificial fistula in the way just described.

Additional elements in the case, at this stage, are best described in the Doctor's own words, which will be found in his "Principles and Practice of Gynæcology," second edition, page 733: "I doubted the existence of any local disease (cystitis) after ascertaining the fact that her life at home had been an unhappy one and calculated to develop the hysterical element, which was a prominent feature in her case, as shown by an hysterical aphonia which had existed previous to the supposed bladder difficulty. She had contracted the opium habit, and was anæmic from being a confirmed invalid. After making the fistula and being unable to detect any disease of the bladder or of the urethra, I became satisfied that the proper course of treatment had been adopted. At the end of a month the dependence upon the use of anodynes, as well as the habits of an invalid, had been broken up, and she was rapidly regaining her general health. She had also nearly recovered her voice, so that only an occasional word would be uttered in a whispering tone. I advised her to visit some friends in the country, and I promised to close the fistula if she could speak naturally at the end of six months."

The patient's own statement as to relief received corroborates the foregoing. I may remark, in passing, that, in addition to making the artificial fistula, a piece of flexible rubber tubing was passed through the urethra, and out through the fistula, the two ends being then brought together in the vagina by a string passed through the lumen of the tubing. The edges of the fistula were thus kept apart and allowed to heal. After this the tubing was removed. When the patient returned to the hospital, after its reopening in the fall of 1878, she entered the service of another surgeon, who closed the fistula. The result was unsatisfactory; control of micturition was not obtained, and the urethra was still quite patulous. The bladder and urethra were then laid open, and in this condition she was discharged, in the spring of 1879.

She applied to Dr. Emmet for readmission to his service in October of that year, and was received.

November 11.—Under ether, the incision in the base of the bladder was extended back to a point one inch from the cervix. The bladder was washed out daily with warm water.

December 2.—Under ether, the fistula which had partly closed was fully opened, and a polypoid growth, previously discovered, was transfixed and ligated.

December 15. — The surface of the bladder is smooth, but congested. Nitrate-of-silver solution (twenty grains to the ounce) applied. These applications were continued at intervals until

January 6, 1880.—The patient now, being in very good condition, was placed under ether, and the urethra was closed. The operation consisted in denuding the edges and bringing the raw surfaces into exact apposition, by means of interrupted silver-wire sutures, which were secured in position by perforated shot clamped closely to the line of union, externally. A fistula three quarters of an inch in length still remained in the base of the bladder. Retentive power did not follow this operation. The urethra soon became relaxed, notwithstanding stimulating and astringent applications.

February 10.—The urethra was again entirely laid open, and a great excess of mucous membrane was found. This was drawn out on either side (of the divided urethra) and cut off. The wound was then closed as at the previous operation, the urethra being now considerably reduced in caliber. Retentive power followed this operation for about an hour at a time; consequently Dr. Emmet deemed it proper to close the fistula, which, as has already been observed, remained, notwithstanding these several operations upon the urethra. This was done February 19th. From this time until March 24th the water was drawn every three hours, being retained in the interval. Then for a few days the urine dribbled away continually, but retentive power, apparently complete, unless she moved about a great deal, soon supervened, and she was discharged April 8th, supposed to be cured.

The condition aimed at did not prove permanent; she gradually lost control by day, but could keep dry at night. Returning to Dr. Emmet six weeks after her discharge, two small openings in the urethra were found. It was then too late in the season for her to reënter the hospital; she was therefore advised to remain at home until the following autumn.

December 6, 1880.—She was readmitted, her condition then being quite a distressing one. There was no control whatever over the bladder, and she suffered extremely from tenesmus and sharp neuralgic pains in the region of the clitoris, in addition to the long existing anæmia and hysteria.

January 4, 1881.—The openings were enlarged, and then closed with four sutures, resulting in no improvement, the water escaping constantly after the operation.

February 7.—A pessary was introduced, and so adjusted as to cause the uterus to press forward upon the bladder. By this means traction was obtained upon the fibers along the base of the bladder extending into the neck. This resulted in ability to retain about half the urine during the day, and *all* at night.

March 15.—A fistula was again made posterior to the neck. The excess of mucous membrane in the urethra (which had again become hypertrophied) was drawn back and cut off, *the edges of the vaginal and vesical mucous membrane being stitched together with continuous wire suture.* Result still unfavorable. All control was lost, and the urethra remained patulous.

April 26.—Urethra and bladder laid open their entire length. The excess of mucous membrane in the vagina and bladder was cut away. A condition of affairs was also found, upon the remedying of which success seemed to hinge. This consisted in a transverse fissure in the anterior wall of the urethra, near the neck, which was probably produced at the time when the urethra was dilated, and which was now discovered for the first time. The edges of this were pared and brought together by a suture.

The urethra and a portion of the bladder were then closed by a series of ten interrupted sutures, passed quite to the meatus, from a point two inches posterior to it. These were secured in position with perforated shot. Before they were removed the urine was drawn at regular intervals, the catheter being introduced behind the sutures, through the fistula.

The urethra seemed now to be restored to its normal status, as far as the condition of the tissues and caliber of the canal were concerned; the next step, therefore, was to bridge the fistula with vaginal tissue pulled over it from either side, to see if retentive power were now possible. This step being only provisional, the tissues were, of course, not denuded, but were merely held in contact by several sutures.

The experiment was a successful one, and on May 24th the provisional sutures were removed; the edges of the fistula were pared extensively at the expense of the vaginal mucous membrane; then a broad strip of tissue was removed from the vaginal surface of the now completed urethra, and a line of sutures nearly three inches in length, fourteen in number, was passed, bringing the sides together. Thus a fold of tissue was brought up over the urethra, causing it to resemble in appearance the normal urethra, and bringing it into the necessary contractile condition.

The sutures were removed on the fourteenth day (June 7th), and the success has been most gratifying.

The patient has improved in every way; has complete control over the bladder, losing nothing involuntarily; says she can not see that she is different, as to this function, from other people; is free from tenesmus, and almost free from the localized neuralgia spoken of.

This end being attained, of course it could not fail to react favorably upon her general system, and after this long series of operations, trying alike to the patient and to her surgeon, it is fair to hope and expect that a permanent result has been reached.

Thus, as a *résumé* of the case, we find that during the five seasons wherein she has been a patient at the Woman's Hospital, she has had, in addition to general treatment, fourteen different operations, eleven of them by Dr. Emmet. Whether it was due to some peculiarity in her constitution, to the skill with which the operations were performed, or to judicious after-treatment, or to all combined, that no acute diseases of the other pelvic organs and tissues accompanied and complicated these repeated interferences, it is impossible to say. The case stands another monument to the skill and patience of a distinguished gynæcologist.

A PROBABLE CAUSE OF TARDY, PAINFUL LABOR, NOT HITHERTO RECOGNIZED.

By GEORGE H. ROHÉ, M. D.

Deformities of the pelvis, mal-presentations of the fœtus, irregular contractions of the uterus, and other pathologico-anatomical conditions are well known as causes of painful, lingering, or difficult labor. To these it is not my intention to refer in this note. Whether any value is to be attached to the observations here reported will remain for others of more experience to decide.

The following is the history of two cases of labor recently under my care:

Case I.—Mrs. K., German, 28 years of age, mother of five children, labors generally easy, consulted Professor Erich in October last on account of painful uterine symptoms. Upon examination, an extensive bilateral laceration of the cervix was found. The patient being in the fifth month of pregnancy, an operation for the relief of the laceration was postponed until after the termination of the pregnancy. In January I was engaged to attend her in her confinement, which she expected about the beginning of March. In the mean time she kept herself quiet, only attending to her household duties, which were not very onerous.

On the 6th of February I was summoned to her, as she believed labor had commenced. On arriving at the house I was told that she had suffered pretty severely from pains resembling labor pains for two days, and that during the day they had been getting longer and coming on at shorter intervals. A digital examination revealed the os high up in the pelvis and dilated to the size of a half-dollar. The rim formed by the os was still thick and fleshy, and evidently in no condition for dilatation for some time to come. Severe pain was complained of when the os was touched by the examining finger. I directed thirty drops of deodorized tincture of opium to be given when the pains became severe, and counseled patience. I saw her at intervals until March 12th, when she was delivered of a well-developed, living male child. The pains had continued at intervals, being more or less severe, for the entire five weeks, yielding only temporarily to the above-mentioned doses of opium, or half-drachm doses of chloral hydrate. She has at this writing (May 15th) recovered from the effects of her labor, and suffers only moderately from the symptoms of cervical laceration. She had never been a sufferer from neuralgia.

Case II.—Mrs. H., white, American, 30 years of age, mother of five children, character of labors generally rapid and easy, was taken ill January 10, 1881, with symptoms of pelvic peritonitis. She believed herself in the sixth month of pregnancy. The treatment consisted in rest, sufficient opium to control the pain, and quinine. She improved slowly, with one relapse on February 26th, until March 21st, when I ceased my visits. I made repeated careful vaginal examinations during the course of her illness, and demonstrated the presence of a deep laceration in the posterior segment of the cervix on the right side. This part was sensitive to the touch, and when lightly pressed invariably made her wince. On the above-mentioned date I made a vaginal examination to determine the condition of the os with reference to the expected approach of her confinement. I found the os dilated to about the size of a silver half-dollar, but thick and fleshy and irregular in outline. Slight pressure on the site of the laceration gave rise to considerable pain. She was assured that she need not expect her confinement for at least a month, and in the mean time was advised to avoid any active exertion. On April 21st I received a message from her, stating that she had been suffering labor pains for twelve hours, and that she was sure the time of her confinement was at hand. On reaching the house I found her suffering what appeared to be severe dilating pains. A digital examination revealed the os still high up, thick and fleshy, and open to the diameter of two inches. I prescribed full doses of opium, and assured her that some days would still elapse before the termination of her labor. The opium only partially controlled the pain. The same want of success attended the administration of thirty-grain doses of chloral hydrate. I saw her almost daily until May 5th, when I delivered her of a well-developed female child. During the last two weeks previous to her delivery I made frequent vaginal examinations, and always elicited evidence of exquisite suffering whenever I touched the lacerated portion of the cervical ring.

She is now—ten days after delivery—well, and attending to her household duties.

The abnormal course of these two cases, and the demonstration of the existence of a lacerated cervix in both previous to the last confinement, attracted my attention, and I examined the obstetrical and gynæcological literature accessible to me, with reference to the connection between laceration of the cervix and lingering labor. With a single exception, authors make no mention of the relations between the two conditions. The exception noted is Goodell, who relates a case* in which pregnancy took place twice in a patient with lacerated cervix, and in which the labor was painful and difficult each time, the patient being confined to bed by her suffering for a month previous to the termination of the labor.

The only other reference to the influence of lacerated cervix upon the course of labor which I could find in literature, is confined to cases of dystocia due to cicatricial contraction of the cervix. This was not present in the two cases here reported.

Emmet † states that his tables show that at least 71·34 per cent. of his patients remained sterile after the injury to the cervix, while there is "no proof that a single case became impregnated after the occurrence of the laceration." These two cases, with Goodell's before referred to, and one related to me by Professor Erich, are positive proof, not only that impregnation may take place in cases of lacerated cervix, but that the pregnancy may proceed to full term.

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* "Lessons in Gynæcology," 2d ed., p. 210.

† "Principles and Practice of Gynæcology," 2d ed., p. 455.

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HABITS.

By H. H. KANE, M. D.

Some of the gentlemen who did me the honor to review my late work * took occasion to state that, in spite of the evidence there adduced, they were still skeptical regarding the existence of such a thing as a "chloral habit." The strong basis of their skepticism lay in the fact that instances of chloral addiction had never fallen under their notice, while cases where this drug had been used nightly for months, and even years, without the formation of such a habit, were known to them. This fact, instead of being denied by me, has, on the contrary, been emphasized, and the statement, based upon these very facts, been made that the continued use of chloral is much less liable to provoke a morbid craving than is that of opium and its alkaloids. It does not follow, however, because the drug has been used for a certain time without the formation of a habit, because these gentlemen have not found these cases in their own practice, and because our literature is not filled with cases of this kind, that they do not exist. Instances where opium and morphine have been used for some time, both by the mouth and hypodermically, without the formation of a habit, and without any apparent ill effects, are recorded. Still, this fact could not be used to support a statement that the opium or morphine habit never occurs. The difference is simply one of degree. Certain cases of nervous disease observed by nerve specialists rarely fall into the hands of the general practitioner, yet it would be absurd for such gentlemen to say: this disease does not exist because we have not seen it.

The fact that recent literature is not rich in facts relating to chloral-taking is not because it does not exist, but because it has not been thoroughly investigated. I have before me now the last edition of Dr. Hammond's very comprehensive work on "Diseases

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* "Drugs that Enslave. The Opium, Morphine, and Chloral Habits." Philadelphia, 1881.

of the Nervous System." I find sections devoted to alcoholism, bromism, hydrargyrism, plumbism, and arsenicism. Because no mention is made by this eminent gentleman of morphinism or chloralism, are we to believe that it does not exist? In a letter which I received from Dr. Hammond over a year ago, he stated that he had never known the morphine habit to follow the use of the hypodermic syringe. Is this any reason for believing that such a thing never occurs, or that it is not a growing evil? Not at all. In proof whereof witness the cases recorded by Levenstein,* of Germany, Loose,† of Bremen, Fiedler,‡ Mattison,# Lahr,‖ and myself.^ Simply because Dr. Hammond has never known the hypodermic use of morphia to eventuate in the formation of a habit, is not sufficient proof to his mind that the habit is never thus formed. Why, then, should the gentlemen before spoken of deny the existence of chloral-craving on the ground that *they* have never seen a case of the kind? No one will endeavor to impeach the truthfulness of Dr. B. W. Richardson, of England. In his work, "Diseases of Modern Life," a very instructive chapter upon chloral-taking may be found. See also Dr. Mattison's able article on Chloral Inebriety in "Proceedings of the Medical Society of the County of Kings," for May, 1879.

In support of what I have said in my book, and have here repeated, I may state that since I have begun to take these patients into my house I have met with two cases of chloral-taking that had undoubtedly become a habit, the real necessity for using the drug having passed away. The treatment was rapid and satisfactory.

I wish to say a few words regarding exactly what I mean by the word "habit." It is a term that is, at best, indefinite, and one that has been used by different writers very loosely. There seems to be no single word in any language that expresses precisely the hold upon the system acquired by certain drugs, when taken for a longer or shorter period. Levenstein finds the term "morbid craving for morphia" best suited to his understanding of the peculiarities of these cases. Like the word "habit," however, it does not express the matter either fully or clearly.

Of those people who are addicted to the continued use of mor-

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* "Morbid Craving for Morphia." London, 1878.

† "Niedersächsischen Aerztevereinsbund," 3te Hauptversammlung, Bremen, June, 1878, p. 14.

‡ "Ueber den Missbrauch der Morphium Injectionen," "Ztschr. f. Med.," 1874; "Jahresb. d. Gesellch. f. Natur-u. Heilk.," Dresden, 1876.

"Med. Record," July 27, 1878; "Am. Jour. of Inebriety," June, 1879.

‖ "Ueber Missbrauch mit Morphia Injectionen," "Allg. Ztschr. f. Psychiat.," 1872.

^ *Op. cit.*, and "Morphia Hypodermically." New York, 1880.

phia and chloral there are two classes, the division resting upon the manner in which the drug was first used. In the one class there is a morbid appetite that may be fed upon excitement, alcohol, absinthe, quinine, hashish, bromide of potassium, chloral, or opium. It may have for its subject anything, and will be classed according to that upon which the appetite becomes most fully fixed. Given a person with such morbid propensities, and let him, either of his own free will or through the agency of another person, begin to use any drug of this class, and he will fix upon that drug in nine cases out of ten and become an habitual user of it. Once habituated to its use, the entire nervous system rebels at its withdrawal, and the victim to his own morbid appetite continues to use the stimulant or sedative, as the case may be, not because the satisfaction first experienced continues, but because any attempt to do without the agent produces such distressing symptoms that the weak-willed patient is compelled to resort to that which he at one and the same time loves and hates. Opium and morphine, but more especially the latter when used subcutaneously, seem to stand first in the list of those substances that have the power to enslave persons of this class.

In the other class there is no morbid craving for any form of stimulant or narcotic, but the long-continued use of the drug, usually for the relief of pain, produces a systemic state analogous to that existing in the first class before the drug was taken. In the one the drug ministers to a morbid craving already existing; in the other it establishes a necessity for continuing its use. The objection to the term "*craving*" in this connection is that it implies a longing for something that is expected to give pleasure, whereas to the majority of habitués pleasure becomes a meaningless word after a short time, and "inability to do without" takes its place. It is really an hereditary or acquired involuntary tendency, that through accident or design becomes fixed upon a certain stimulant or narcotic that develops, increases, and perpetuates the tendency.

As an example of the second class of cases, we may take those persons who, having absolutely no desire or longing for tobacco, commence its use simply because it is the custom, despite the fact that it sickens them at first. Having continued its use for some time, they find that they have fastened upon themselves a habit that requires no little will power to shake off. Tobacco is the type of those substances that possess less *fastening* power than morphine. To this class belong alcohol, chloral, hemp, the bromides, quinine, etc. In the case of each, we find persons who can and do use it for a certain length of time without the establishment of that systemic state that calls for a repetition of the dose as soon as the effect of the preceding dose has worn off. The knowledge of this fact, however, does not prove to us that certain persons, owing to some peculiarity wholly unknown to us, will not under the same circumstances become abject slaves to the necessity for continued use.

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Editorial.

THE QUESTION OF PATENTS.

We understand that the Medical Society of the State of New York has appointed a committee to inquire into the matter of what changes, if any, are advisable in the code of ethics. From the make-up of the committee we do not doubt that its report will be founded upon sterling work, undertaken with the sole purpose of advancing the real interests of the profession, which, indeed, should be the only object of a code of ethics, if we must have one. Should this anticipation prove true, the society may fairly be looked to to indorse the committee's recommendations, and, broached under such auspices, they may stand a chance of sober consideration by the American Medical Association. The committee is not likely to recommend radical changes unless it is made plain to them that such changes are approved of by a considerable portion of the profession. We trust, therefore, that those who have given thought to these matters may bring their views and conclusions to the committee's knowledge, either by publishing them or by direct correspondence with the committee.

For our part, we would urge upon the committee that it would be an act of propriety, as well as a matter of simple justice, to secure the abrogation of that portion of the code that proclaims it "derogatory to professional character . . . for a physician to hold a patent for any surgical instrument or medicine."

We do not propose to argue at length as to the propriety or impropriety of a physician's holding such a patent, for we think that the statement which we have quoted from the code would not have commended itself to physicians in general, nor have been suffered to remain so long a part of the code, had it not been bolstered up by being incorporated into the same sentence that declares it also derogatory "to dispense a secret nostrum." Whether this grouping of the two acts for common denunciation was an ingenious device on the part of those who abhorred the idea of a physician's holding a patent, and who chose this way to spread their abhorrence, we are unable to say; but it is certain that the idea of dispensing secret nostrums is revolting to high-minded men, and, when they find this practice classed in the same category with the possession of a patent, it is no wonder that, without giving the matter much thought, they gradually come to look upon the latter as a heinous offense.

Very little reflection is needed, however, to show how diverse the two are, and how monstrous it is to class them together. The code has no denunciation for the holder of a copyright; and yet there is no essential difference between a copyright and a patent. A copyright covers a publication, and every one recognizes that about this there can be no secrecy; hence to couple the holding of a copyright with the dispensing of a secret nostrum would carry its own refutation. But a patent also is a publication—nothing of secret composition or of secret mechanism can be patented. Analogy shows us, then, that there is nothing in the nature of things to justify the assertion that it is derogatory to professional character for a physician to hold a patent. As a matter of fact, we find that some physicians do hold patents, and that they are not looked upon by their professional brethren as having debased themselves by so doing. We understand that Paquelin's cautery is patented. Whether the patent is held by the inventor or by the maker matters little, for, if now held by any other person than M. Paquelin, it must have been held by him originally. Who has whispered that M. Paquelin has degraded himself? Is an act right in France, but wrong in America? What, then, shall be said of Dr. Dawson, who patented a cautery battery of his invention? We have not heard that he has lost caste, and, for our part, we admire the independence he showed in acquiring and holding the patent right as much as we admire the ingenuity displayed in the construction of the battery.

By declining to throw obloquy upon these gentlemen the profession has shown that it does not regard the possession of a patent as derogatory. That declaration in the code that so sets it down is, therefore, a dead letter, and ought to be expunged.

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Reviews and Literary Notes.

Ueber den Kreislauf des Blutes im menschlichen Gehirn. Untersuchungen von A. Mosso, Professor der Physiologie an der Universität Turin. Mit 87 Abbildungen im Text und 9 Tafeln. Leipzig: Veit & Comp., 1881. Pp. vi–222.

If the author of this work had confined himself merely to a description of his experiments upon the circulation of the brain, his monograph would still be a contribution of considerable value to physiological literature. But much more than its modest title would indicate is contained within the pages of Professor Mosso's book. Not satisfied with the opportunities which he enjoyed for investigating his chosen subject, he seems to have followed out with laborious care all the side-questions involved in his main problem, and, in each case, to have tested for himself the results obtained by his predecessors. As instances of such deviations into neighboring fields of physiological research, we may mention the chapters on the Form of the Pulse, the Nature of Sleep, the Circulation in the Ear of the Rabbit, and especially the admirable digression upon the Pulmonary Circulation, as well as that upon the Influence of Respiratory Movements upon Blood-Pressure. In such digressions he always presents something worth reading, whether the result of his own researches or a *résumé* of the experiments of others.

Although Mosso is an Italian, the influence of his German preceptors appears to weigh strongly upon him. Not only does he adopt their language, but he has so far imitated their modes of composition as to conform to a custom, which we had thought peculiarly Teutonic, of prefacing his work proper with an "historico-critical" dissertation, which is meant to include everything written upon the subject from the time of Pliny to the present day. Yet few readers, we fancy, will be inclined to find fault with this borrowed illumination, since the perusal of the introduction furnishes much that is valuable and interesting.

Of greater interest, however, is the account of the author's own experiments. For these he appears to have enjoyed exceptional facilities, as he had at his command three patients in whom the brain was so exposed to view as to admit of the direct application of instruments. From these patients he took a vast number of tracings, and a large part of his book consists of selections from such tracings, with accompanying commentaries. The value of such an exhibit is, of course, great or small, according to the accuracy with which it was originally prepared, and the fullness with which the modifying conditions are detailed. From a careful study of Mosso's book, we must say that his experiments appear to be most satisfactory, as regards both accuracy and completeness. They were made under widely varying conditions, and show clearly the effect produced upon the cerebral circulation by intellectual operations, mental emotions, and sensory impressions; by sleep; by changes in the vascular caliber, whether active or passive; by changes in the cardiac pulsation; by respiratory movements; by the inhalation of nitrite of amyl; and by the application of pressure or alterations of attitude. With these experiments are associated those made with the plethysmograph upon the volume of the arm and leg. In this way not only is knowledge gained in regard to the circulation in the extremities, but also a comparison of tracings, taken simultaneously from the forearm and from the brain, serves to show what alterations of the circulation are to be considered local and what of a general character. The plethysmograph was also called in by Mosso to determine the form of the pulse. On this subject, it may be noted, his views differ somewhat from those which are commonly accepted. All the characteristics of the pulse, except the rhythm, and to some extent the intensity, he regards as purely local phenomena and quite independent of changes in the heart's beat. Accordingly, he does not agree with those who attach a special (and, in some cases, a pathological) significance to particular forms of a sphygmographic tracing, especially as his own experience has taught him that such forms are constantly varying under the influence of external stimuli.

Experiments, bearing more directly upon the way in which the cerebral blood-supply is maintained, are described in the closing chapters. Chapter XIV, upon the Circulation within the Uninjured Skull, is a record of the investigations which led him to adopt, on experimental grounds, the view which Cappie had previously enunciated from theoretical considerations; in which it is asserted that the dilatation of the arteries by a new access of blood is compensated for by a contraction of the veins, so that the entire mass of blood in the brain remains nearly the same, although it is variously distributed in the different branches of the vascular system. One circumstance which renders this mechanism possible is the presence of venous sinuses with rigid walls, permitting a free outflow of blood under all conditions; another is the absence of valves in the cerebral veins, allowing a normal regurgitation to take place whenever the arteries contract and there is a tendency to the formation of a vacuum in the cranial cavity.

In Chapter XV, upon the Movements of the Cerebro-Spinal Fluid, the author seems to have proved the falsity of the prevalent doctrine upon the subject. In fact, direct experiments upon animals and upon a child affected with spina bifida showed that the cerebro-spinal fluid did not pass from the skull into the spinal canal or in the reverse direction to compensate for respiratory variations in the volume of the brain. Indeed, as he points out, such a fact might have been inferred upon theoretical grounds; for the suction-power necessary to draw back into the skull such a column of fluid is, obviously, very great—much greater, at all events, than the power required to drive an equal amount of blood onward into the veins, in which the pressure is so low.

The chapter on the Nature of Sleep is of interest, as illustrating the character which respiration assumes during sleep, and the effect of sensory impressions upon the organism when in this condition. Such impressions, although leaving no trace in consciousness, were observed to have a very marked effect upon the character of the respiration and the caliber of the vessels. Following out the same line of inquiry, the author repeated Schiff's observations upon the so-called spontaneous movements of the vessels in a rabbit's ear; and he found that, in every instance, such movements were attributable to the effect of external sensory impressions or of internal emotion.

For us the most interesting part of the book is that in which Mosso has discussed the relations of the respiratory movements to the systemic and pulmonary circulations. The consideration of this side-problem (occupying nearly one quarter of the book) demanded much mechanical ingenuity; but the inventor of the plethysmograph was equal to the emergency. His artificial schemata of the pulmonary circulation are models in their way; and there appears to be no flaw in the reasoning by which their working is interpreted. We refer here especially to the experimental critique of previous investigations. In this the author has carried out with original apparatus the theoretical conceptions of Quincke and Pfeiffer, and has repeated the experiments of other physiologists with improved methods. We would gladly present here the results of this research; but the reader will doubtless be able to gather them with more satisfaction from the book itself. Enough has been said already to indicate the value of the work to those who are interested in this department of physiology. To such we need hardly add that it will well repay the time spent in its perusal.

Coulson on the Diseases of the Bladder and Prostate Gland. Sixth edition, revised by Walter J. Coulson, F. R. C. S., Surgeon to St. Peter's Hospital for Stone, etc. London: J. & A. Churchill, 1881. Pp. xxx–607.

The fifth edition of Coulson was published in 1857. The sixth edition of this work, therefore, has to record the advances made in the special department of medicine concerned during nearly a quarter of a century. Comparing these two editions together, one can not but recognize the fact that the interval which separates them has not been a period prolific of important events. Progress there has been unquestionably, but chiefly in maturing the results and in elaborating the methods of an antecedent period. The only event of salient importance which marks the progress of the past twenty-five years is that connected with the name of our countryman, Dr. Bigelow, of Boston; but litholapaxy is yet only in its infancy, and its main history will in all probability pertain rather to the years to come than to the period which has passed.

The office of the present editor of Coulson has been thoroughly and conscientiously performed, and the work will continue to be a monument honorable to the name of the original author. No little labor is implied in the copious and generally judicious references to recent investigations. These give the work a certain eclectic character, which makes it valuable rather as a book of reference than as an independent and original authority. In some practical matters, especially such as relate to treatment, something remains to be desired. There is often a lack of fullness or explicitness in the directions given for treatment, which, if supplied, would greatly enhance the practical value of the work. But any deficiencies on this score are compensated for by the abundance of new material afforded, which is not readily accessible elsewhere.

The chapter on the Chemistry of the Urine, with which former editions opened, has been omitted on the ground that the subject was "too extensive to admit of suitable treatment in a work like the present." It seems to us, considering the great importance of examinations of the urine, that some space might very profitably have been devoted to it. On the other hand, we think that much of the matter that relates to the bladder of the female, especially in the chapter on Urinary Fistulæ, might appropriately have been left to works on gynæcology.

The chapter on the Anatomy and Physiology of the Bladder and Prostate is an exceedingly interesting and valuable one. In connection with the physiology of the bladder much attention is paid to the mechanism by which the urine in the bladder is retained and discharged. Also the writer discusses very fully the evidence bearing upon the power of absorption of the vesical mucous membrane. His conclusion is that it has no absorbing power so long as it is in a normal condition, but acquires this power when its structure has been modified by disease, or when its epithelium has been abraded by mechanical means. He adds the caution that "when medicinal substances, poisonous in large doses, are injected into the bladder, care should be taken not to exceed the ordinary dose, at least until it has been proved that this is inefficacious."

With regard to the management of retention, the writer, having described the different methods of relieving the bladder, concludes that "puncture through the rectum and external urethrotomy are the most suitable operations for the majority of cases." Although the operation of supra-pubic aspiration is mentioned, we think it has hardly been rated at its proper value. A procedure so much simpler as well as safer than either of those recommended should always, we believe, take precedence, at least for all cases in which the retention is due to temporary obstruction on account of spasm or congestion.

The writer makes no allusion to the dangers of suddenly evacuating an over-distended bladder, except that of syncope, when a large quantity of urine is drawn off suddenly, "the patient being in an erect position"; but nothing is said of the liability to hæmorrhage (of which Gouley has written especially) or of the possibly fatal danger to the bladder and kidneys described by Sir Henry Thompson and others. We think this a noteworthy omission.

The most interesting portion of the book, and that which evinces the most careful study, comprises the chapters on the Chemistry, Structure, and Causes of Urinary Concretions. A good deal of prominence is given to the views of Dr. Ulzmann, of Vienna, with regard to the formation of calculus. This writer concluded from a series of experiments that the formation was mainly conditional upon the form which the uric-acid crystals assumed. He found that when an acid was added to normal urine, the uric acid was deposited, and the form of its crystals depended upon the extent to which the urine had been acidified. When the acid is added "in the proportion of 1 to 20 or 1 to 10, the crystals are deposited in the form of elongated rods attached to each other, and radiating like the ears of corn in a sheaf," and "the spinous character of the crystals becomes increased in proportion to the quantity of acid." It is by means of these acicular crystals, he claims, that what he terms "the primary stone formation" takes place; and this always occurs in the kidneys. "The secondary formation" is due to a process of incrustation, which takes place always in the bladder. The nucleus in this latter case may be either a uric-acid calculus descended from the kidney, or foreign bodies, mucus, pus, or coagulated blood. Ulzmann further maintains that a metamorphosis of primary calculi takes place in alkaline urine, but is always centripetal—in opposition to Meckel, who believed that the change was centrifugal. Dr. Ulzmann's views are quoted very fully, and it is claimed had not previously been referred to by English writers on the subject. Little is said of the colloid theory of molecular coalescence advocated by Ord, Rainey, Vandyke Carter, and others.

A chapter is devoted to Litholapaxy. In his preface the editor says: "The invention, by Dr. Bigelow, of a method for the rapid removal of a calculus from the bladder, without the risks attendant upon the use of the knife, bids fair to create a complete revolution in the doctrines hitherto current with regard to lithotrity, and in the mode of performing that operation." The account given of the operation is a good one, though the writer omits to notice some modifications of the instruments used, which have been made both by Dr. Bigelow and by others.

Four chapters are given to Diseases of the Prostate. We find no reference made to Mercier's operations for removal of prostatic obstructions at the urethro-vesical orifice by internal incision and excision. While these operations have not yet been generally accorded a place in urinary surgery, they are at present receiving considerable attention, and merit at least a mention.

The typography and general form of the book are excellent. Though not exceeding its predecessor in bulk, it is more compact in form, and evidently contains considerably more matter. Few new illustrations have been added, but many of the old ones have apparently been recut.

A Manual on Diseases of the Eye and Ear, for the use of Students and Practitioners. By W. F. Mittendorf, M. D., Surgeon to the New York Eye and Ear Infirmary, etc. Fully illustrated with colored lithographs and woodcuts. New York: G. P. Putnam's Sons, 1881. Pp. viii–445. [Price, $4.]

In special practice the Eye and the Ear are two old cronies; and, although there is something incongruous about their intimacy, and their relations are not quite as cordial as they once were, they will, nevertheless, "keep company" with each other for a long time to come. Usually it has been the cruel custom of authors to separate them, but in the volume before us they are both allowed to occupy the same bed, so to speak, being divided only by a single sheet. There is at least one reason, therefore, why this text-book must be a useful one for those much-lectured individuals, "the student and general practitioner."

The author says that he has aimed to make a practical and brief manual, designed only for elementary study, and containing as thorough a description as possible of those diseases which are most likely to be encountered in general practice. Three hundred and fifty-eight pages are devoted to the Eye; the section on the Ear comprises seventy-one pages. The result is a handsome volume, convenient in size, comprehensive, and readable. Mingled with its good points, however, are many defects, and we do not think that the author has made the most of his opportunity. The plan of the book is such a good one that we can not but feel regret that it has not been more satisfactorily developed. The descriptions are not always clear, and the matter is badly arranged in many places. There is a noticeable lack of woodcuts (only nine altogether), which we regard as a serious blemish where the aim is to be elementary. Many of the descriptions of operations and of instruments are inadequate, and some of the means of diagnosis—such, for instance, as the uses of the tuning-fork and von Graefe's test for insufficiency of the internal recti muscles—are not made clear enough for a student. Some of the plates taken from Sichel might well have been replaced by original ones, and just here we think there was an excellent chance to give this book an advantage over others of its class. The plates of the drumhead are among the worst that we have ever seen. There are many evidences of carelessness, and this constitutes a grave defect in a work designed to convey clear and accurate ideas to those who are supposed to be quite ignorant of the topics discussed. We will quote some illustrative passages:

On p. 318, speaking of the optic axis and the visual line: "These two axes are not identical; they are different; they are not parallel, but they intersect one the other at the optical center, and thus form an angle called the *visual angle.* Upon the size of this angle depends the size of the retinal image," etc. This is entirely wrong, and in striking contrast with the more correct definition of the visual angle given on p. 235. On p. 57 we find: "If one of the conjugate muscles is weaker than the other or paralyzed, requiring a greater effort to make it perform its duty than the other, this same effort, exerted on the conjugate muscle, will make it contract considerably more; the result will be an abnormal direction of the other eye, *secondary deviation.*" And again, on p. 60, we read: "If the hand is placed over the healthy eye in such a manner that the eye can be observed while the patient is made to look with the affected eye at a given object, say the finger, moved in the direction of the paralyzed muscle, he will make a great effort to do so; this effort is felt and responded to by the conjugate muscle of the healthy eye, and it will carry this eye much farther from the normal direction of the eyeball, causing this eye to squint even more than the paralyzed eye did before; this is called secondary deviation." These passages seem to be intended for definitions of secondary deviation, but they are very poor ones. On p. 67 concomitant squint is thus defined: "If both eyes differ in this respect, the eye with the greatest amount of hypermetropia will require the most powerful accommodative effort, and this will cause the greatest convergence, and the difference of the visual axis is at once established. This squint is therefore called concomitant squint, as it is so intimately associated with accommodation."

In enumerating eight symptoms of conjunctivitis, No. 3 is: "Light, and especially artificial light, is very troublesome"; and No. 8 is: "Bright lights are irritating, but there is not great dread of light." In differentiating exophthalmus from "prominent eyes," myopia, corneal and scleral staphyloma, and hydrophthalmus are given as examples of exophthalmus.

On p. 369: "The most reliable test to determine the amount of hearing of a patient is the tick of a watch. This should be heard by a normal ear at 36 inches; if, however, it is only heard at 6 inches, the hearing power is $\frac{6}{36}$ or $= \frac{1}{6}$." Readers of this might infer that all watches had a uniform tick.

The meaning of this sentence, on p. 385, is somewhat obscure: "Hypodermic injections of acetic acid, but also of persulphate of iron or carbolic acid, will destroy a polypous growth within a few days."

On p. 391, speaking of the "light-spot": "The more funnel-shaped the membrane the larger will be this cone, and in a sunken-in drumhead it is usually quite large"—then a reference to a plate which shows a sunken drumhead with *no* light-spot. As a rule, one of the first changes in a "sunken-in drumhead" is a diminution of the light-spot, as the author himself says on p. 401. The word *umbo* is incorrectly defined as meaning *shadow.* A laxator tympani *muscle* is described. This structure is considered by the best authorities to be only a ligament. All that is said of the action of the stapedius muscle is that "it compresses the contents of the vestibule."

Definitions in parentheses are sometimes introduced in a very clumsy way, as in this sentence, on p. 21: "Ecchymosis of the lids may be the result of a blow or any other injury (black eye)." Definitions are also mixed with the text, without parentheses or italics, as in this sentence: "Inflammation of the lid may be seated in the skin, erysipelas, the connective tissue, phlegmon, or the glandular tissues." On p. 97: "The conjunctiva which had been pale or but slightly congested becomes now very red, œdema of the lids, chemosis, and a profuse muco-purulent discharge follows—in fact the picture of an acute blennorrhœa supervenes that of the chronic process—acute granulations." Awkward sentences like the one given above are very numerous.

There is considerable erroneous spelling, such as: *Marriot* for Mariotte, *Holmgreen* for Holmgren, *Carmault* for Carmalt, *Grave's* disease for Graves's disease, *pigmentory*, *phlegmanous*, *stapidius*, *sensative*, *ethiology*, etc.

We think it contributes to befog the student's mind to describe thirty-three varieties of cataract, and to classify the different forms of purulent conjunctivitis, as if they were different diseases.

The ideal text-book in this department of medical science has not yet appeared, and, after examining each successive candidate for the position, we feel like uttering the barber's cry—"Next gentleman."

Contributions to Obstetrics and Gynæcology. By ALEXANDER RUSSELL SIMPSON, M. D., Professor of Medicine and Midwifery and the Diseases of Women and Children in the University of Edinburgh. Edinburgh: Adam & Charles Black, 1880. Pp. xii–347.

THE essays that make up this volume have all appeared before in various medical journals, but we consider that, by publishing them together and in definite order, Professor Simpson has conferred a favor upon the many who would profit by reading them consecutively in their proper relations to each other.

The contents of the book are divided into two parts—obstetrical and gynæcological. First, we have the author's inaugural address, as President of the Edinburgh Obstetrical Society, in 1875, in which, under the title of Emmenologia, a cursory but highly interesting sketch is given of the functions peculiar to woman. The remaining papers are arranged under the following titles: Intra-uterine and Congenital Conditions of the Fœtus (the acardiac fœtus, intra-uterine small-pox, intra-uterine peritonitis, congenital melanotic tumor, congenital goître, and hydronephrosis); the Umbilical Cord (diseases of the umbilical vein, torsion of the cord, and knot on the umbilical cord formed during pregnancy); the Placenta (dimidiate placenta, placenta prævia, and post-partum hæmorrhage); Morbid Conditions of Pregnancy (hydramnios, extra-uterine pregnancy, notes of a fatal case of chorea gravidarum, and on the complete evacuation of the uterus after abortion); Mechanism of Labor (the head-flexion in labor, and head markings); and Morbid Conditions of Labor (dystocia with dorsal displacement of the arm, notes of a complicated case of labor, with remarks on the postural treatment of prolapsus funis, spontaneous rupture of the uterus during labor, and turning *versus* forceps). With the exception of a recent article on "Basilysis," which, out of its proper position, closes the volume, this completes the obstetrical portion of the book.

In the gynæcological division we find the following titles: the Use of the Volsella in Gynæcology; the Vagina (atresia vaginæ, fibroma vaginæ, sarcoma vaginæ, and carcinoma vaginæ in a pregnant woman); the Uterus (the treatment of fibroid tumors of the uterus, sarcoma uteri, carcinoma uteri, amputation of the cervix uteri in cases of elongation, forms of sterility, and notice of an anteversion pessary); the Ovary (cystic tumors of the ovary containing hairs, case of double oöphorectomy, or Battey's operation, with remarks, ovariotomy cases, and pelvic hæmatocele); and Method of Case-Taking in Gynæcology.

There is nothing dry or ponderous or over-technical about Dr. Simpson's treatment of these various themes, so that his collected essays form the most desirable and at the same time the most instructive reading for the general practitioner. The volume is of convenient size and handsomely printed.

A Treatise on Bright's Disease and Diabetes, with especial reference to Pathology and Therapeutics. By James Tyson, A. M., M. D., Professor of General Pathology and Morbid Anatomy in the University of Pennsylvania, etc. With illustrations. Including a section on Retinitis in Bright's Disease. By William F. Norris, A. M., M. D., Clinical Professor of Ophthalmology in the University of Pennsylvania. Philadelphia: Lindsay & Blakiston, 1881. Pp. 312. [Price, $3·50.]

Dr. Tyson gives a succinct account of the physiological anatomy of the kidney. The much-vexed and important subject of the presence of connective tissue in the kidney is thoroughly discussed, and the author comes to the conclusion that there is a small amount of connective tissue in both the medullary and the cortical portions of the kidney.

The nerves of the kidney have always afforded an interesting study to physiologists and pathologists. Dr. Tyson devotes but small space to a consideration of them. He makes some very sensible and practical suggestions as to the method of studying the histology of the kidney.

The directions for testing for albumen are about the same as given in his book on the "Practical Examination of the Urine." He cautions to make the examinations carefully, as frequently a very small quantity of albumen may and does escape detection. The observations of Dr. Munn, of this city, on this point seem to have escaped the notice of Dr. Tyson.

Under the subject of tube-casts, the author discusses the nature of the material which forms the basis of all casts, the hyaline material. He does not consider it true fibrine, as this would imply the presence of fibrinogen and fibrinoplastine. It would, perhaps, be better to call it *fibrinoid* material until it is demonstrated exactly what it is.

Just now there is much discussion among pathologists and clinicians as to the significance of casts in the urine. This subject is quite thoroughly gone over by the author. He says he has found casts in the urine when there was no albuminuria at the time; but that he has never found true casts in the urine when he considered the kidneys normal. He subscribes to Bartels's statement that "the formation and the excretion of a cast need be by no means contemporaneous events."

Can one, by the kind of casts present, diagnosticate the nature of the renal malady? is a question to which Dr. Tyson would not give a positive answer. He thinks some varieties of casts give considerable assistance in making a diagnosis. He takes the middle ground between those who put their main reliance on the kind of casts found, and those who, like Charcot, consider that the clinical importance of urinary casts has been much exaggerated.

Virchow's classification of Bright's disease, first given to the world in 1858, always seems the most simple, if it is correct. His division, as is well known, was of those in one of which the disease originates in the interstitial tissue; in another in the blood-vessels, and in a third in the tubules. This to the beginner in the study of the pathology of renal disease was always easily remembered. But this does not satisfy Dr. Tyson, nor does the classification of Grainger Stewart or that of Dickinson.

His division is quite simple. He divides all forms of Bright's disease into *acute* and *chronic.* The acute is represented by a single form—acute parenchymatous nephritis. The chronic includes: I. Chronic parenchymatous nephritis. II. Lardaceous disease, a chronic process. III. Interstitial nephritis, which is only chronic.

In the causation of acute Bright's disease Dr. Tyson thinks that in a few cases it can be directly traceable to alcohol.

Under the head of Treatment of Acute Bright's Disease the author says he has never seen any of the extreme prostration which is said sometimes to result from the use of jaborandi. He has apparently had no experience in its use in the acute uræmia which occurs in the puerperal state. The experience of others, as reported, is decidedly against that of Dr. Tyson. Jaborandi undoubtedly acts well in some cases, but if the patient is at all feeble it is always a dangerous remedy if given in the large doses usually employed. He regards jaborandi, for its action on the skin, and the time-honored elaterium and croton oil, as the main reliances for elimination of the urea. He does not hesitate to do venesection if the patient is not too feeble. In reference to opium, he assents to the caution which has always been suggested in reference to its use. He believes he has seen death hastened by it in one case of previously unsuspected *chronic* Bright's disease. Like many others, he entirely misquotes Professor Loomis, of this city, in reference to the use of opium. He says: "Professor L. treats with apparent success cases of uræmic convulsions with hypodermic injections of large doses of morphia (one half-grain or more)—doses which I would fear to use under ordinary circumstances in the absence of renal disease." Professor

Loomis specifies most particularly that it is in "*acute uræmic convulsions*" that he uses the large doses of morphine. It is specially tolerated under these circumstances. It is well known now that under other conditions (not necessarily accompanied with pain) large doses of opium are specially tolerated. Patients in the paroxysms of asthma, and hysterical women, are instances of this special tolerance.

Space is given to a short chapter on "Retinitis in Bright's Disease," by Dr. William F. Morris.

A chapter is devoted to Suppurative Interstitial Nephritis. In the etiology he refers to the observations of Klebs (confirmed afterward by Ebstein), that this form of kidney disease has its origin in the presence of bacteria in the tubules. These bacteria excite inflammation, causing a purulent pyelitis and then a circumscribed renal inflammation. The bacteria get in from without principally by the introduction of dirty catheters. Dr. Tyson thinks the whole subject of the parasitic origin of disease is *sub judice*, and therefore not proven.

A chapter is also devoted to the "Cyanotic Induration of the Kidney."

Dr. Tyson's clinical histories are not complete. Pathology is gone into very minutely; even theories long ago given up are discussed at unnecessary length. The impression one receives on reading the book is that the author is more of a pathologist than a clinician.

In the preface, sufficient apology is made for including Diabetes under the same cover with Bright's disease. He offers nothing new on the subject of diabetes. In the treatment of diabetes mellitus the first drug he makes use of is ergot. He seems to have had more fortunate results from its use than the majority of physicians. He also favors the plan of making diabetics opium-eaters. Reference is made to the recent suggestion of the use of salicylate of sodium in twenty-grain doses, four times a day, but Dr. Tyson has no experience of his own to offer.

The book finishes with a chapter devoted to Diabetes Insipidus, which he considers, with Senator, "rather a troublesome than a dangerous complaint."

There is nothing new in the book, but it is a good *résumé* of both subjects, and presents the latest information on both Bright's disease and diabetes. A good *résumé* oftentimes makes a more valuable book than original work.

The mechanical part of the book is unusually good, and does credit to the publishers.

Lectures on Syphilis. Delivered at the Harveian Society, December, 1876. By James R. Lane, F. R. C. S., Surgeon to St. Mary's Hospital, etc. London: J. & A. Churchill, 1881. Pp. vi–95.

The *raison d'être* of this little volume is explained in the preface as follows: "The object . . . was to trace as concisely as possible the progress made of late years in the investigation of venereal disease, to point out what may be considered to be the generally accepted views of the profession at the present time, as well as to indicate the principal points of divergence, and to express, as impartially as possible," [the author's] "own views and opinions thereupon."

The writer was well qualified for the task which he undertook, and the rapidity with which the first edition has been exhausted illustrates the good judgment of the author in foreseeing a need of the medical public. The questions discussed are wholly practical, and it is, perhaps, immaterial that the mooted points regarding the nature of syphilitic contagion should have been omitted. We would call attention particularly to his observations concerning the Acts of Parliament to regulate contagious diseases and the establishment of Lock Hospitals, which institutions meet the author's entire approbation.

Cyclopœdia of the Practice of Medicine. Edited by Dr. H. von Ziemssen, Professor of Clinical Medicine in Munich, Bavaria. Vol. ix. Diseases of the Liver and Portal Vein, with the Chapter relating to Interstitial Pneumonia. By Ponfick, Thierfelder, von Schüppel, Leichtenstern, Heller, and Jürgensen. Translated by Arthur H. Nichols, M. D., Hamilton Osgood, M. D., Edward W. Schauffler, M. D., and Walter Mendelson, M. D. Albert H. Buck, M. D., Editor of American edition. New York: William Wood & Co. 1880. Pp. viii–928.

This volume completes the series—seventeen in all. It opens with an anatomico-physiological Introduction, by Ponfick, in which he treats of the topography, structure, and function of the liver, and of cholæmia. According to Ponfick, many varieties of icterus, which would otherwise remain obscure, can be referred to obstruction to the flow of bile from the "acceleration or retardation in the respiratory movements of the diaphragm"; as, for instance, "certain forms of bilious pneumonia, icterus accompanying different affections of the lungs and pleura, possibly also pyæmia, puerperal fever, and other diseases, so far as they are complicated with accumulations, the formation of infarctions in the lungs, or with pleuritis."

Thierfelder follows with preliminary physico-diagnostic observations upon Diseases of the Liver: Floating Liver, Hyperæmia of the Liver, Perihepatitis, Suppurative Hepatitis, Interstitial Hepatitis, Syphilitic Hepatitis, Acute Atrophy, Simple Atrophy, and Hypertrophy of the Liver. In abscess of the organ, he favors puncture with the cannula, and, although he refers to McConnell's cases, in which aspiration was performed, he does not recommend the aspirator, nor does he mention the results that have followed its use in this country, in England, and in Germany. Besides the immoderate use of alcohol, syphilis and intermittent fever are among the causes of cirrhosis. Contrary to the opinion of some recent authorities, the prognosis in this affection is regarded as "absolutely unfavorable," and the treatment, unless syphilis exists, can only be symptomatic. Under "Hypertrophic Cirrhosis" is described a form of interstitial hepatitis, which "is distinguished pathognomically by the circumstance that the diminution in the volume of the organ, resulting from the shriveling of the newly-formed connective tissue, such as characterizes the latter stages of ordinary cirrhosis, does not supervene, not even where the process continues for a long while, but the hyperplasia preponderates even until the fatal termination of the affection." In this variety of cirrhosis the weight of the liver amounts to between two thousand and three thousand grammes; the form of the organ is not appreciably altered; "the cut surface, whose color may be yellow or green in different shades, presents now and then somewhat prominent parenchyma-islets, varying in size from a hemp-seed to a poppy-seed, and between these islets are found cross-pieces of fibrous tissue broader than the former by four- and fivefold." The spleen also is considerably enlarged by chronic hypertrophy. Icterus manifests itself early, though occasionally it is preceded by derangements of the digestive function; "pain recurs from time to time in the hepatic region, accompanied invariably by an increase in the icterus and hepatic swelling, as also in most cases by fever." Emaciation and cachexia appear at an early stage, but the general nutrition may continue fair for a long time. Ascites is at times absent even in those much reduced, but it frequently accompanies the general dropsy induced by cachexia. The duration of the disease is generally two years and over—seldom less than one. The habitual use of alcohol is the chief etiological agent in this disease, though "the first germ of the disorder may also be implanted by certain infectious diseases, such as typhus and cholera." Frequently there is no assignable cause. Syphilis has never been found in any of the cases reported. As regards treatment, no result has followed the remedies that have been used.

Von Schüppel devotes thirty-five pages to the Pathological Anatomy of Cancer of the Liver, and Leichtenstern treats of "The Clinical Aspects" of the same disease. The section on Amyloid Degeneration, Fatty Liver, Pigment Liver, is contributed by von Schüppel. There is a short chapter on the Parasites of the Liver, by Heller. Diseases of the Biliary Passages and Portal Vein are described by von Schüppel, and take up over three hundred pages.

The article on Interstitial Pneumonia, by Jürgensen, is an excellent one, and we regret that it did not appear in its proper volume. It seems out of place here.

A Text-Book of Human Physiology, designed for the Use of Practitioners and Students of Medicine. By Austin Flint, Jr., M. D., Professor of Physiology and Physiological Anatomy in the Bellevue Hospital Medical College, New York, etc. Illustrated by three lithographic plates and three hundred and fifteen woodcuts. Third edition, revised and corrected. New York: D. Appleton & Co., 1881. Pp. xviii–978.

Flint's "Physiology" has been such a standard text-book with American readers that the appearance of a third edition within so short a time need scarcely excite surprise. It is not hard to understand the causes of its popularity. The lucidity of its style, the clearness and accuracy of its descriptions, especially when anatomical details are under discussion, and the judgment of the author in giving just what the reader wants, warrant a favorable reception among all who are engaged in the study of this difficult science.

The additional matter is found chiefly in the chapter on Animal Heat, in which are described recent experiments of the author's upon the heat developed by the oxidation of hydrogen in the system. To make room for this required condensation of other portions of the same chapter; but this has been done judiciously, so that nothing of importance has been omitted, nor has the continuity been impaired.

We regret that the author has retained in this edition the old values of the chemical equivalents, now so universally discarded. Of clerical errors we have noted one only, by which, on page 710, section of the *anterior* columns of the cord is said to produce difficulty in muscular coördination. Otherwise textual errors seem to have been eliminated with great care. In the matter of typography and illustration this edition fully maintains the high standard of its predecessors.

The Human Body: an Account of its Structure and Activities and the Conditions of its Healthy Working. By H. Newell Martin, D. Sc., M. A., M. B., Professor of Biology in the Johns Hopkins University, etc. New York: Henry Holt & Co., 1881. Pp. xvi–621–34.

This is professedly a popular treatise, and yet it has characteristics which recommend it to the professional reader. Professor Martin includes a large range of facts within a small compass, and has also brought his statements into accord with the later discoveries. If, when views are conflicting, he presents one only for the reader's consideration, it must be acknowledged that his selection is usually judicious. In some points, moreover, he is especially good, as in regard to the classification and homology of tissues, and in his remarks upon the varieties of nerve fibers and the sources of energy. His hygienic advice also seems excellent. One or two errors we have noted, which seem, however, to be mere slips of the pen, as on pages 357 and 406. In attempting to avoid obscurity of style the author has at times fallen into the opposite error of a baldness of expression which has now and then an amusing effect. The make-up of the book is very fair, and, on the whole, the work is one which can be commended, not only to the general reader, but also to the practitioner who wishes to refresh his memory of physiology and learn the results of the latest investigations without going too laboriously into the methods by which they were attained.

Books and Pamphlets Received.—Index-Catalogue of the Library of the Surgeon-General's Office, United States Army. Authors and Subjects, vol. ii. Berlioz–Cholas. Washington: Government Printing Office, 1881. 4to, pp. [12]–

990. ==== The Applied Anatomy of the Nervous System, being a Study of this Portion of the Human Body, from a Standpoint of its General Interest and Practical Utility, designed for Use as a Text-Book and a Work of Reference. By Ambrose L. Ranney, A. M., M. D., Adjunct Professor of Anatomy, etc., in the Medical Department of the University of the City of New York, etc. With numerous illustrations. New York: D. Appleton & Co., 1881. Pp. xxvii–500. ==== Anatomical Studies upon Brains of Criminals. A contribution to Anthropology, Medicine, Jurisprudence, and Psychology. By Moriz Benedikt, Professor at Vienna. Translated . . . by E. P. Fowler, M. D., . . . Department of Translation, New York Medico-Chirurgical Society. New York: Wm. Wood & Co., 1881. Pp. 185. ==== The Principles of Myodynamics. By J. S. Wight, M. D., Professor of Surgery and Lecturer on Physical Science, at the Long Island College Hospital. New York: Bermingham & Co., 1881. Pp. 162. ==== Supplement to Ziemssen's Cyclopædia of the Practice of Medicine. Edited by George L. Peabody, M. D., Instructor in Pathology and Practice of Medicine, College of Physicians and Surgeons, New York, etc. New York: William Wood & Co., 1881. Pp. viii–844. ==== Medical Electricity: a Practical Treatise on the Application of Electricity to Medicine and Surgery. By Roberts Bartholow, A. M., M. D., LL. D., Professor of Materia Medica and General Therapeutics in the Jefferson Medical College of Philadelphia, etc. With ninety-six illustrations. Philadelphia: Henry C. Lea's Son & Co., 1881. Pp. xx–17 to 262, inclusive. [Price, $2·50.] ==== Therapeutic and Operative Measures for Chronic Catarrhal Inflammation of the Nose, Throat, and Ears. Forty illustrations. Part ii. By Thos. F. Rumbold, M. D. St. Louis: Geo. O. Rumbold & Co., 1881. Pp. xvi–169 to 467, inclusive. ==== The Disposal of the Dead: a Plea for Cremation. By Edward J. Bermingham, A. M., M. D., etc. New York: Bermingham & Co., 1881. Pp. 89. ==== American Nervousness, its Causes and Consequences: a Supplement to Nervous Exhaustion (Neurasthenia). By George M. Beard, A. M., M. D., etc. New York: G. P. Putnam's Sons, 1881. Pp. xxii–352. ==== The Management of Wounds. By David Prince, M. D. Philadelphia: Lindsay & Blakiston, 1881. Pp. 54–iii. ==== Habitual Mouth-Breathing: its Causes, Effects, and Treatment. By Clinton Wagner, M. D., Professor of Diseases of the Throat, University of Vermont, etc. New York: G. P. Putnam's Sons, 1881. Pp. 52. [Price, 75c.] ==== The Hunterian Oration delivered at the Royal College of Surgeons of England on the 14th February, 1881. By Luther Holden, Ex-President, etc. London: J. & A. Churchill, 1881. Pp. 47. ==== Medical Societies: their Organization and the Nature of their Work. By J. Collins Warren, M. D., etc. An Address delivered at the Centennial Meeting of the Massachusetts Medical Society, June 8, 1881. Cambridge: Riverside Press, 1881. ==== Contribution to the Correction of Strabismus by the Advancement of the Rectus. By A. E. Prince, M. D., Jacksonville, Ill. [Reprint.] ==== Tenotomy in the Treatment of Congenital Club-Foot. By Ap Morgan Vance, M. D., etc. [Reprint.] ==== A Case of Abscess of the Liver; Aspiration; Recovery. By George F. Duffey, M. D. [Reprint.] ==== The Quality of Mental Operations debased by the Use of Alcohol, etc. By T. L. Wright, M. D., Bellefontaine, Ohio. [Reprint.] ==== The American Medical College Association, fifth annual meeting, held at Richmond, Va., May 2d and 4th, 1881. ==== The Melbourne Medical Students' Society, 1881. ==== Report of the Medical Missionary Society in China, for the year 1880. ==== Third Annual Announcement of the College of Physicians and Surgeons of St. Joseph, Mo.

Clinical Reports.

WOMAN'S HOSPITAL.

Reported by Andrew F. Currier, M. D., Assistant House Surgeon.

(Service of Dr. THOMAS ADDIS EMMET.)

VESICO-VAGINAL FISTULA.

Mrs. E. McC., aged 41, born in Scotland, residing in Onondaga County, New York, was admitted October 2, 1880. She has been married twenty-one years; has had eight children and two miscarriages; has been sick since her last labor, three years since, the prominent symptoms being paralysis of the right side from the waist down, and complete loss of control over the bladder. She was in labor with the last child for thirty hours, and then was delivered instrumentally. A large rupture into the bladder occurred, subsequently extensive sloughing of the posterior vaginal wall adjacent to the cervix, also of the posterior cervical lip, and a portion of the anterior, followed by cicatrization and contraction. There is also pain in the back, with laceration of the perinæum. Her menstruation has been quite regular and normal. Locomotion is impossible without crutches. Her bowels are constipated. In addition to the symptoms already given, examination showed a retroverted uterus, and the posterior fornix vaginæ almost obliterated, the tissues in this vicinity being exceedingly dense. There was a vesico-vaginal fistula, the dimensions of which nearly corresponded to those of a quarter of a dollar, beginning just anterior to the cervix. Its edges were very hard, and through it the vesical mucous membrane protruded.

November 11th.—The patient has been following the hospital regimen, including careful diet, and has had hot vaginal injections, morning and evening. She has had several chills, which have been controlled by quinine.

December 23d.—Much improved. The hot-water injections have softened the tissues materially. The paralysis has disappeared, and she is able to walk without crutches.

February 7, 1881.—An examination of her urine had revealed the presence of pus, and pus was also found in the vagina when she was brought before Dr. Emmet for operation. Its source could not be traced, and Dr. Emmet, suspecting kidney trouble, postponed the operation, although the patient had been etherized.

10th.—Patient again examined by Dr. Emmet. Pus was again found, and traced to a point in the tissues behind the symphysis pubis.

April 5th.—General treatment has been continued since the last note, and to-day ether was again administered, but the purulent discharge again precluded the closure of the fistula. The sinus from which the pus flowed was laid open as far as it could be traced, which was in the direction of one of the ureters.

May 3d.—Circumstances appearing favorable—i. e., no kidney complications having developed—the fistula was closed, the edges being denuded, and the opening prolonged in the long axis of the vagina. Fourteen silver sutures were used, being twisted with only sufficient firmness to bring the edges of the fistula into apposition. The ends, about half an inch long, were bent so as to lie *squarely* and *flatly* upon the vaginal wall. Sims's sigmoid catheter was introduced into the bladder, the legs were tied together, and the patient was kept in bed upon her back for the next week. The vaginal injections (hot water) were kept up morning and evening, the bowels not being encouraged to move for three or four days. Pain was occasionally severe, especially toward evening, and was subdued by a quarter of a grain of morphia hypodermically.

19th.—Sutures removed. A small opening remains near the posterior angle of the wound, through which a portion of the urine escapes.

June 14th.—The remainder of the fistula was close d to-day, and with the greatest difficulty. It was very small, and lay posterior and to the right of the cervix, adjoining the sulcus vaginæ of that side. In order to get at it, the perinæum was drawn as far back as possible with the short blade of Sims's ordinary-sized speculum, and the right side of the vagina was held up with a depressor. The fistula was thus greatly elongated, following the direction of the long axis of the vagina, as before, and was closed with eight sutures. The subsequent treatment was the same as after the previous operation.

23d.—Sutures removed. A small fistula still remains.

30th.—As the hospital is about to be closed for the summer, the patient is discharged, to return for further treatment.

Remarks.—Above all things, we are impressed with the necessity of keeping the bladder empty in parturitions, more especially in protracted ones. *The patient says* her bladder was not emptied during the thirty hours of labor. *Secondly*, The great value of the hot vaginal injections was abundantly demonstrated. The effused inflammatory material underwent absorption; the nerves were thereby liberated, and the paralysis was relieved. The tissues also were materially changed, becoming more elastic and vascular, and fit for a plastic operation, which would have been out of the question under the previous condition. *Thirdly*, The important bearing of lesions of other organs is to be carefully weighed before attempting an operation. The condition of suppuration in this case might have been due to grave disease of the kidney or ureter. The careful examination of the urine and the harmless result of anæsthesia rendered this improbable. *Fourthly*, However skillful the operator, a single operation will often fail in effecting a cure. A large stock of patience is invaluable, for several attempts may be necessary. Bearing this in mind, few cases can prove utterly intractable.

SUBMUCOUS UTERINE FIBROID.

Mrs. H. V. K., aged 50, born in Ireland, and living at Rondout, New York, was admitted to the hospital May 2, 1881. She had been married twenty-five years; had had two children and no miscarriages. Her last labor took place nineteen years ago. Both labors were difficult. She first menstruated at sixteen, and has always been regular until six years ago—always without pain. The menopause has not yet been attained. For the past six years there has been excessive uterine hæmorrhage, so that the intervals between menstrual periods were obliterated. The bowels are constipated. The patient is unable to walk, being very weak and anæmic; has taken medicines without any benefit. Styptics have been used when the hæmorrhage was sufficient to excite alarm. Upon examination, a firm tumor, smooth to the feel, and of about the size of a hen's egg, was seen protruding from the cervix, pressed tightly against the posterior lip and the posterior vaginal wall. Hæmorrhage was very easily excited upon disturbing it, and it was not deemed advisable to sound the uterus.

May 10th.—The patient's general condition has greatly improved under the hospital regimen. Hot vaginal baths have been administered morning and evening, and no hæmorrhages of any account have taken place. At 2 P. M. the patient was etherized, and Emmet's écraseur was carried around the growth. The latter was so dense and so firmly fixed that the instrument was broken without accomplishing the desired end. The tumor was then entirely cut away with curved scissors. It proved to be a fibroid, weighing about three ounces, growing from the anterior wall of the uterus. Not much blood was lost during the operation, and a copious injection of hot water stopped the flow entirely. The vagina was then securely tamponed with pads of absorbent cotton dipped in alum-water. No rise of pulse or temperature followed at any time. The patient was kept in the dorsal position with the knees raised. Three times daily the vagina and uterus were carefully syringed for about five minutes with a hot one-to-forty carbolic-acid solution. Convalescence was uninterrupted, and on May 28th she was discharged cured, eighteen days after the operation, and twenty-six after her reception into the hospital.

LACERATION OF THE CERVIX UTERI.

Mrs. D. D., of Oswego, New York, was received into Dr. Emmet's service March 30, 1881. This patient was previously in the service of another surgeon, having been admitted for chronic oöphoritis. Nervous and neuralgic symptoms had been very prominent. She received the baths, iodine treatment, and galvanization for a long time, with little if any relief. She had had two children and one miscarriage. Her menstrual history showed nothing of any importance.

A laceration of the cervix and one of the perinæum, of only moderate severity, were not considered as bearing greatly upon her condition, but in the fall of 1880, other treatment having been ineffectual, the lacerated cervix was closed. She made a good recovery, and early in 1881 she was discharged improved, returning again as above mentioned. Examination now revealed considerable pelvic cellulitis, with a retroflexed uterus.

April 21st.—Upon further examination, wedges of cicatricial tissue were found in the cervix, also *pockets* where the tissues had not united after the previous operation. Examination at these points was excessively painful, the patient describing the sensation as similar to that produced by touching the exposed nerve of a tooth.

May 16th.—She has been wearing a retroversion (Thomas) pessary, which was removed, as it seemed to be a source of irritation. Has also been suffering from an acute attack of cellulitis, but is now much improved.

17th.—The patient being under ether, the cervix was divided on either side to the utero-vaginal junction. The union resulting from the previous operation proved to have been not much deeper than the mucous membrane. The extensive deposit of cicatricial tissue on either side was considered by Dr. Emmet as the cause of the patient's severe neuralgic symptoms. This was carefully removed. Nine sutures were passed through the right side, from below upward, the last one being superficial and secured by a perforated shot. Seven sutures were passed through the left side. The legs were then tied together, and the patient was taken to her room.

The effects of the ether were quite unpleasant; the patient became very violent, and tossed about the bed for some time. She also retched and vomited a great deal. She was finally quieted by a quarter of a grain of morphia administered hypodermically. She subsequently suffered a great deal of pain in the vagina, in the left side of the abdomen, and over considerable areas in the anterior thoracic region. This was of a neuralgic character, and was allayed by moderate doses of morphia. An hysterical element in the case was quite probable, though there was undoubtedly some severe suffering. The bowels were constipated for a week, and were then moved by enemata with great difficulty.

26th.—Several of the sutures were found to have cut through the tissues, and were lying partly detached in the vagina. Their presence doubtless had caused much of the pain in this region. Four additional sutures were placed upon either side, the loose ones being removed. The end of the cervix was then amputated with curved scissors, a piece from a quarter to half an inch in length being removed, and the stump was closed by two sutures, one on either side of the canal.

June 2d.—Treatment since the operation has been simply of a routine character, the pain being less severe than after the previous operation. The wound has healed and is looking perfectly well. The sutures were removed June 7th. Convalescence has not been as rapid as usual, for the patient has long been accustomed to the habits of an invalid.

21st.—Patient is sufficiently strong to undertake the journey homeward. She is much improved in appearance, and the local neuralgias are far less troublesome.

Remarks.—The point so strongly insisted upon by Dr. Emmet in his description of the operation for lacerated cervix—namely, the complete removal of all cicatricial tissue in the angles made by the laceration—was overlooked in the first operation. The union was imperfect at best, and another operation would have been called for, even without the existence of the deposit of cicatricial tissue. It was most interesting to watch the gradual subsidence of the nervous symptoms after the final operation. The question arises, Will it be permanent? As she is to return to the hospital for closure of the perinæum, it will be possible to follow up the case.

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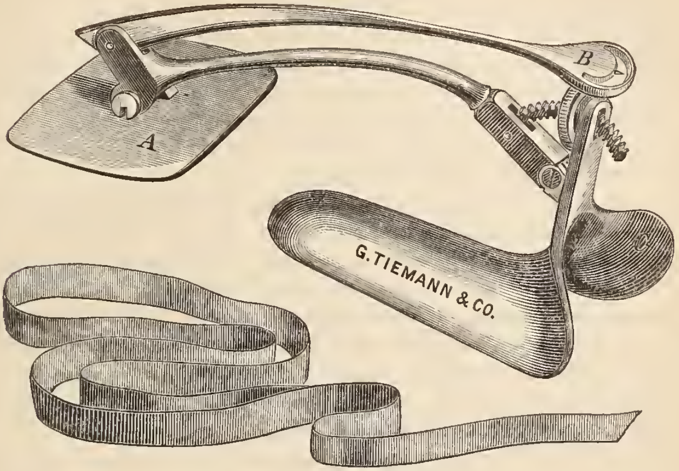
Proceedings of Societies.

NEW YORK OBSTETRICAL SOCIETY.

A regular meeting was held May 17, 1881, Dr. James B. Hunter, President, in the chair.

Modification of Erich's Self-retaining Sims's Speculum.—Dr. Alexander S. Hunter, present by invitation, showed such a speculum of his invention. The advantages claimed for it over Erich's were: 1. It secured a better field through which to operate. 2. The shape and divergence of its flanges secured such equal distribution of pressure that its use was attended with the least possible discomfort to the patient. 3. The change in the shape of the fulcrum, and the change in the direction of the lever, rendered the instrument self-retaining at all degrees of penetration, irrespective of the patient's movements. This he considered the crowning excellence of a self-retaining instrument, and to Dr. Erich he conceded all the credit for having utilized so important and perfect a mechanical principle. 4. The fulcrum pinion was so modified that it could be detached in an instant, thereby rendering the instrument less bulky than the ordinary Sims's, and with the fulcrum thus detached the instrument was just as convenient, and, on account of its flanges, was even more efficient than the latter, when used for the simple purpose of inspection. 5. The lever buckle was of but half the size of Erich's, was round instead of angular, and its tooth was at all times guarded; it could be attached, disengaged, or the tension varied in an instant; it would never let go while at work, and would not get out of order. He stated that the instrument could be adjusted as quickly as the ordinary Sims's speculum, except for the time required to pass the loop of the strap over the patient's left shoulder and under her right arm. This, however, was compensated for by the fact that with this instrument it was seldom necessary to loose the patient's clothing, a consideration not to be overlooked by the busy practitioner. This it accomplished by securing more perfect extension of the spine, and by giving support to the muscles in this condition of abnormal tension. After the strap was once buckled it did not require to be shifted in order to change the position of the blade in the vagina, for by lifting the fulcrum from its bearing on the sacrum and drawing the tissues upward or downward the blade would assume the position required. The necessity for having the instrument correctly made was emphasized, for a slight error in the direction of the lever would render its use inefficient, but, if properly made, it would work in all cases without subsequent change. The instrument shown was made by Messrs. Tiemann & Co.



Modified Sims's Speculum.—Dr. Mundé showed a speculum, which was an ordinary Sims's, with the superior portion of the right flange widened in a manner to hold up the buttock (which was usually done by the hand of an assistant), so as to allow of the entrance of more light. It was not self-retaining.

Modification of Thomas's Anteflexion Pessaries.—Dr. Mundé said the projecting hinge of Dr. Thomas's anteflexion pessaries excoriated the vaginal walls which pressed upon it after some months' wearing; and in one case which came under his observation it had occasioned, at the end of five months, a small fistulous tract which opened into the rectum. In that case the pessary was not too large when introduced. He presented two such pessaries, the hinges of which he had had altered so as to sink them into the body of the pessary. ═══ Referring to Dr. Mundé's modification of Sims's speculum, the President said it was much like that of Emmet's, the distance between the flanges of which could be widened or narrowed at pleasure. ═══ Dr. Mann said that he, too, had had one made two years ago, with hinged flanges.

Vicarious Menstruation; General Peritonitis without Characteristic Symptoms.—Dr. Mann related a case as follows: Dr. W. A. M. Wainwright, of Hartford, told him he had a case in the hospital which he might be interested to see. Dr. Mann accordingly was present when the patient was etherized for a more thorough examination. She was about forty years of age, and had not menstruated for a number of years; he was not sure that she had ever menstruated. She had some pain in the neighborhood of the uterus, and vomited a considerable quantity of blood every month. The last month or two she had had a great deal of pain, had lost flesh and strength, and had become irritable. When she entered the hospital Dr. Wainwright diagnosticated the case as one of vicarious menstruation. Under ether, the uterus was found to be small, its cavity being about two inches in depth; the vagina was large, and somewhat relaxed. There were no adhesions, or other abnormality that could be discovered; the uterus was perfectly movable. The examination was easy to make, as the abdominal wall was thin and lax. It was suggested that an attempt be made to bring about menstruation in the regular way, and with that view a sponge-tent was introduced into the cervix each month. This was done three times, and each time the patient felt considerable relief, and once there was an attempt at menstruation. The patient sat up in bed, feeling better. A relapse occurred, however, and she died. At the autopsy there was distinct evidence that there had been a general peritonitis—there being an effusion of lymph and of bloody serum into the abdominal cavity—although no symptoms of peritonitis had existed during life. The right broad ligament was markedly and uniformly thickened, having been the seat of an old cellulitis, and at the junction of the Fallopian tube with the uterus there was an abscess, about a quarter of an inch in diameter, which had ruptured into the abdominal cavity and excited the peritonitis. Another small abscess, near the larger one, was ruptured during the post-mortem examination; it contained five or six drops of pus. There was scarcely a trace of an ovary on that side, and the left ovary was almost completely atrophied. There was also dropsy of the left Fallopian tube. The uterus, as before stated, was atrophied. ═══ Dr. Foster asked if the condition of the right broad ligament might not have been better ascertained by an examination without an anæsthetic, for the patient might then have given evidence of any local tenderness. ═══ Dr. Mann replied that probably such would have been the case.

Diagnosis of Sarcoma of the Uterus.—Dr. Polk related a case as follows: A woman, between thirty and thirty-five years of age, came under his care, in Bellevue Hospital, in September last. Her health had been good until the June before, at which time she had a miscarriage, she thought at the third month. Everything went on well until her next regular menstrual flow, when she flooded profusely. When she applied for relief he dilated the cervical canal, introduced his finger, and removed what appeared to be a partly organized piece of the original placental structure, which he supposed it was. Having had a number of such cases, all of which did well, he did not hesitate to tell his class that the patient would soon recover; but she menstruated too freely at her next period, and quite profusely at the second. Then, upon examination, the mass was found to have been reproduced, and to be a sarcoma, springing from the posterior wall of the uterus, near the fundus. Had there been a microscopical examination in the first instance, a correct diagnosis might have been made, and the error of prognosis avoided, but, the history being the usual one of retained placenta, and the gross appearances of the mass being similar to those of a long-retained piece of placenta, his suspicions were not awakened. A point of special interest was the fact that, to the finger, the interior of the uterus differed in no way from that of one in which a piece of placenta had been lodged. ═══ Dr. B. McE. Emmet said that if excessive hæmorrhage occurred at the first menstrual period after miscarriage, we should be justified in inferring that there was a portion of placenta retained; if there were menorrhagia at a more remote period, however, the suspicion of a new growth would be well founded. The usual location of such growths was, as in this case, in either cornu of the uterus, at the point of entrance of the Fallopian tube. He had removed a number of such growths which, without a microscopical examination, appeared to have a malignant character, namely, by constantly recurring—and that in spite of even repeated applications of fuming nitric acid. One in particular he had now in mind, in which, however, all bleeding had finally ceased, at the first for only nine months, but since then for a year. ═══ Dr. Mundé said he had removed a large number of new growths (pronounced by Dr. Heitzmann to be myxo-adeno-sarcoma) with the curette, and in only three instances had they returned—in one, four times, in the others, two and three times. They were less likely to return when the sharp curette was used, scraping them off close up to the uterine wall, than when the dull one was employed. When they returned after removal with the dull curette, the sharp instrument should be used. If allowed to return often, he thought they might finally become malignant. He would ask the question: In what proportion of cases did the growth recur after thorough removal with the curette? He showed two sizes of a sharp, flat curette which he had had made for that purpose. It was shaped like Thomas's dull-wire loop. ═══ Dr. B. McE. Emmet said that probably the majority of the members would agree that the sharp curette was certainly less safe than the blunt instrument. He had not curetted very often, simply because he had been able to overcome the difficulty by other means, and as Dr. Polk's case showed us the possible dangers of curetting, viz., pyæmia and death, he thought we should be very guarded in our choice of a sharp instrument, which worked entirely in the dark and raked off we did not know what.

Joseph E. Janvrin, M. D.,
Henry D. Nicoll, M. D.,
Frank P. Foster, M. D., *ex-officio*,
Committee on Publication.

NEW YORK DERMATOLOGICAL SOCIETY.

THE 116th regular meeting was held January 25, 1881, Dr. L. DUNCAN BULKLEY, President, in the chair.

GELSEMIUM AS AN ANTIPRURITIC.—The discussion of Dr. Bulkley's paper, entitled "Note on a New Antipruritic Remedy" (published in the January number of this Journal), being in order,* Dr. PIFFARD asked Dr. Bulkley the strength of the tincture of gelsemium that he had employed. ═══ Dr. BULKLEY replied that he had used the ordinary tincture of the shops. ═══ Dr. PIFFARD thought that great care should be taken in ordering the tincture, and that, on account of its lack of uniformity in strength, it was a very dangerous preparation to prescribe. He presented several specimens of the tincture, ranging in strength from 1:5 to 1:2. He mentioned other remedies that he had found to have an antipruritic action, such as aconite, protiodide of mercury, jaborandi, and caladium. The last named had given the best results, although the effect of pilocarpine had been very prompt and decided, and he thought the latter drug was safer than gelsemium.

Dr. FOX, after having used without much benefit a strong solution of carbolic acid, bromide of potassium, and a mixture of camphor and chloral, in a case of psoriasis, in a patient seventy-two years of age, had resorted to gelsemium (Keith's tincture) to allay the intense itching. The following results were obtained: Ten drops produced no effect; fifteen drops aggravated the itching; eighteen drops made it still worse, according to the patient's statement. Finding that the tincture obtained was not that which he had ordered, and was productive of no physiological effect, Keith's tincture was procured and was given in one daily dose at night. Five drops produced no effect; ten drops gave slight relief; fifteen drops gave decided relief; twenty drops produced about the same effect; twenty-five drops caused very decided relief, but also gave rise to double vision; thirty drops, the patient said, "pulled down the eyelids," and secured sleep. Before taking the drug, the patient had been obliged to pass water very frequently at night, but, after beginning its use, he got up only two or three times. Dr. Fox thought well of gelsemium as a narcotic, but did not consider it proper to term it an antipruritic. ═══ Dr. BULKLEY asked Dr. Fox if he had warned his patient of its effects on the eye. ═══ Dr. FOX replied that he had, and that fifteen drops had produced a slight effect.

Dr. MORROW remarked that he could offer no affirmative testimony as to the value of gelsemium as an antipruritic. He had used the drug quite extensively, and had found it to possess quite a wide range of therapeutic properties, but he had never observed any effect upon the cutaneous sensibility. He was also somewhat familiar with its use in the hands of others, and, so far as he was aware, no other observer had ever noted any such effect. If a more extended investigation should prove that it did possess decided antipruritic properties, Dr. Bulkley would be entitled to the full credit of the discovery. He was inclined to think, however, that its claims as an antipruritic had been urged with more pretension than its real value warranted. He thought that physicians were too apt to claim new properties for well-known drugs without testing them carefully in a large number of cases, and eliminating all possible sources of error—especially the *post-hoc-ergo-propter-hoc* reasoning, which is so often deceptive when applied to the action of drugs upon the system. It was a well-known principle in therapeutics that the action of a drug upon the healthy organism often afforded valuable indications as to its adaptability to morbid states. The physiological effects of gelsemium had been carefully studied by Bartholow, Ott, Ringer, and others, and we found nothing in their statements from which, by any process of analogical reasoning, its action as an antipruritic could be inferred. He stated that he had experimented somewhat with this drug *in propria persona*, and would give the results of such experimental proving for what they were worth. The earlier and more characteristic effects of gelsemium seemed to be manifested through the ocular apparatus. The first effect noted, after taking a sensible dose, was a sense of fullness in the supra-orbital region, followed soon by drooping of the upper lid, dilatation of the pupil, dimness of vision, diplopia, and a general sense of muscular relaxation. He had never pushed its effect beyond this point. There was no disturbance of the mental functions and no impairment of sensibility. These symptoms usually came on in half an hour after the ingestion of the drug, and completely passed away in the course of two or three hours. If the administration of the drug were pushed until toxic symptoms supervened, there was a blind and staggering gait, followed by a complete abolition of muscular movement and by paralysis of the nerves of sensation. The numbness, or anæsthesia, was one of the ultimate toxic effects, and possibly was due to carbonic-acid narcosis, as it was well known that gelsemium acted as a direct poison to the respiratory center.

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* By a rule of the society, any paper published by a member becomes the special order at the first meeting after its publication, even although (as was the case in regard to the papers discussed at these two meetings) it has not been read before the society.—EDITOR.

In the experiments of Drs. Ringer and Murrell, particular attention was paid to the influence of this drug upon the mind and sensation. The cutaneous sensibility was unaffected. This was carefully tested by pinching, pricking, and the use of the compass. There was absolutely no loss of sensation, although the patient was fully under the influence of the drug, and all its characteristic physiological effects were manifested. Dr. Ringer stated that he had devoted particular attention to this point, as gelsemium had been introduced into England as a specific for odontalgia and other neuralgias, especially those affecting the second and third divisions of the fifth pair. The conclusions arrived at by these experimenters were in direct antagonism with the assumption that the drug possessed antipruritic properties.

Dr. Morrow's principal objection to having the paper indorsed by the Dermatological Society was chiefly on account of what he conceived to be the dangerous dose recommended. From ten to fifteen drops of the tincture of gelsemium every half hour, until one or two drachms had been taken, seemed to him an unsafe method of administration, and liable to be followed by toxic effects, especially if a reliable tincture were used. As was well known, there was no officinal tincture of this drug, and the market preparations were by no means uniform in quality and strength. The preparations of different makers, or even of the same maker, for that matter, varied largely accordingly as they were made from the green or the dried root. The dried root, when kept for some time, seemed to become entirely inert, so far as any medicinal action was concerned. He wished to correct Dr. Bulkley's statement that the smallest recorded dose which had produced death in an adult was two drachms of the tincture. Cases had been reported in which death had resulted from the administration of thirty and forty drops. In one of Ringer's cases, in which ten drops had been ordered three times a day, the second dose had produced toxic symptoms. In a case reported in the "Medical Record" three-drop doses, given three times a day, produced the full physiological effects, followed by paralysis of the bladder. He recalled a case of fatal poisoning by gelsemium which occurred in this city a few years ago. A delicate lady had been ordered four powders, each containing one grain of gelsemin (the so-called resinoid). The second dose produced death within two hours after taking it. The publicity given to this case called forth reports, from a number of physicians, of cases in which dangerous symptoms had followed what were considered ordinary doses of the drug. He prescribed it with the same caution that he would aconite, veratrum, and other drugs of this class.

In offering these criticisms he did not wish to underrate the great value of gelsemium when prescribed judiciously and under appropriate conditions. In the South and Southwest it was regarded as a most valuable febrifuge and anti-periodic, and was used largely in remittent and typho-malarial fevers. It had been used in epilepsy with advantage, also in tetanus, as its action on the spinal cord was directly opposite to that which took place in tetanus. It had been found an admirable remedy in spasmodic asthma and in all irritable coughs dependent upon abnormal excitability of the respiratory nerves.

In his own case, he had found it of signal service in supra-orbital neuralgia—an affection to which he was frequently subject. Five-drop doses, every hour or two, generally gave relief, except when this condition was associated with deranged stomach and liver. But the therapeutical application of this drug which had most interest for members of the Dermatological Society was its action upon the genito-urinary apparatus. He had found it a valuable remedy in incontinence of urine from irritable bladder, probably from its effect in relieving muscular spasm. It was no less valuable in difficult urination from urethral congestion, from spasmodic, and even from organic stricture. In these cases it acted more nearly as a specific than any remedy with which he was acquainted.

Dr. Piffard stated that he had employed it in supra-orbital neuralgia, and had found that it acted more quickly than any other drug, especially when the pain affected the right side. He remarked that its effects on the urethra had been recognized fifty years ago. The late Dr. Darby had mentioned these effects in his thesis on the drug. Twelve years ago it was used at Charity Hospital in acute cases of gonorrhœa, with benefit, in doses ranging from five to ten drops of the tincture three times a day. ═══ Dr. Bulkley said that he used the tincture of medium strength, and that all his cases had occurred in private practice, numbering about twenty. In one half of them there was no relief. In one recent case very marked relief was obtained. He was confident of its antipruritic action. ═══ Dr. Piffard replied that he would not now question its antipruritic effect, as he had had no experience bearing upon that point; but he looked upon it as a dangerous drug, if used in the manner recommended.

The 117th regular meeting was held February 22, 1881, Dr. Frank P. Foster in the chair.

Ergot in the Treatment of Acne.—The discussion of Dr. Denslow's paper, "On the Etiology and Treatment of Acne" (published in the February number of this Journal), being in order, Dr. Piffard said that he had used ergot in one case of rosacea, half a fluidrachm of the fluid extract three times a day. At the end of a week the patient complained that his trouble was worse than ever before, and his digestion was much interfered with. He improved considerably after the use of ergot was discontinued. The speaker would object to the long-continued use of the drug, fearing its poisonous effects, and also its action on the brain, the spinal cord, and the uterus. Roulin had noticed that, in cattle, ustilago maidis, a drug resembling ergot, caused a shedding of the hair and hoofs. Lombroso had used ustilago for ichthyosis with success, in daily doses of a gramme [fifteen grains].

Dr. Fox had used ergot in six cases of acne and one of rosacea; all in females. In two or three of the patients the acne was benefited for two or three weeks; the case of rosacea remained unchanged. The other acne patients did not improve. In one case the use of ergot was discontinued, as it deranged the stomach, and ergotine was substituted, but no improvement followed. Under the circumstances, he could not say that he was impressed with the value of the remedy.

Dr. Robinson had had no actual experience with ergot in the treatment of acne, but he did not agree with the author of the paper as to the etiology of the disease. He did not think that it was due to retention of the sebum, but that it might be due to over-secretion, especially at the time of puberty. Granting that over-secretion was the cause, he did not think that contractions of the muscles of the skin would be sufficient to overcome it. When due to hyperæmia, ergot might be of use, by lessening the amount of blood as the result of contracting the muscular fibers of the vessels.

Dr. Sherwell concurred in the main with Dr. Robinson's criticisms on the paper, and believed that in cases of acne in which the disease was due to retention of secretion, the muscular tissue could [be stimulated as well by alternate applications of hot and cold water, thereby avoiding the possible objections to ergot in some cases.

Dr. Piffard also agreed with Dr. Robinson in the main; although he thought that contraction of the muscular fibers of the skin might affect the glands. He had used faradization in acne, but thought that its effect was due to its action on the muscular fibers of the vessels. He had used ergot externally in a case of rosacea, but without benefit.

Dr. Denslow remarked that he still entertained the views expressed in the paper as to the etiology of the disease, and that, from his success with ergot thus far, he was convinced that in certain cases of acne, especially those in which the exciting cause no longer existed, the drug would prove to be of great value.

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Reports on the Progress of Medicine.

MONTHLY REPORT ON OBSTETRICS AND GYNÆCOLOGY.

No. VII.

By FRANK P. FOSTER, M. D.,
PHYSICIAN FOR DISEASES OF WOMEN TO THE OUT-PATIENT DEPARTMENT OF THE NEW YORK HOSPITAL.

Obstetrics.

1. Croom, J. H.—Report of the Royal Maternity and Simpson Memorial Hospital, for the quarter ending October 31, 1880. "Edinb. Med. Jour.," May, June, 1881.
2. Hart, D. B.—On some of the phenomena of parturition in their practical aspects. *Ibid.*, June, 1881.
3. Hennig.—Ein Beitrag zur vergleichenden Physiologie und Geburtskunde. [Gesellsch. f. Geburtsh. in Leipzig.] "Dtsch. med. Woch.," May 7, 1881.
4. M'Clenahan, H. M.—Medical knowledge of the North American Indians. Midwifery. "Med. and Surg. Reporter," May 14, 1881.
5. Bradley, J.—A contribution to the jurisprudence of abortion. "Detroit Lancet," May, 1881.
6. ———.—Is quinia abortifacient? "Louisville Med. News," May 14, 1881.
7. Queirel.—Des varices pendant la grossesse et l'accouchement. "Ann. de Gynéc.," Apr., May, 1881.
8. Bribach, B.—Chloral in the first stage of labor. "St. Louis Courier of Med.," May, 1881.
9. Croom, J. H.—On a complication of occipito-posterior positions of the vertex. "Edinb. Med. Jour.," June, 1881.
10. Kidd.—Funis repositor. [Dublin Obstet. Soc.] "Dublin Jour. of Med. Sci.," April, 1881.
11. Sänger, M.—Ueber Zangen mit Zugapparaten und axengemässe Zangenextraction. "Arch. f. Gynäk.," xvii, 3, 1881.
12. Mercier, C.—Hemiplegia from injury to the cranium by forceps during delivery. "Brit. Med. Jour.," May 28, 1881.
13. Ashby, T. A.—Observations on the management of the perinæum during labor. "Maryland Med. Jour.," June 1, 1881.
14. Sänger.—Zur Behandlung der frischen Scheiden-Dammrisse. [Gesellsch. f. Geburtsh. in Leipzig.] "Dtsch. med. Woch.," May 7, 1881.
15. Veit, J.—Ueber die Naht frischer Dammrisse. *Ibid.*, May 14, 1881.
16. Abegg, H.—Zur Entfernung der Nachgeburt nach Credé. "Arch. f. Gynäk.," xvii, 3, 1881.
17. Weis, C.—Beitrag zur Frage über die Behandlung der Nachgeburtsperiode. "Centralbl. f. Gynäk.," May 28, 1881.
18. Sänger.—Der Hebeirrigator bei schweren Blutungen post partum. [Gesellsch. f. Geburtsh. in Leipzig.] "Dtsch. med. Woch.," May 7, 1881.
19. Payne, R. L.—Mistletoe, its physiological action and some of its clinical applications. "N. Carolina Med. Jour.," May, 1881.
20. Apostoli, G.—Sur une nouvelle application de l'électricité aux accouchements. "Ann. de Gynéc.," May, 1881.
21. Tarnier.—Hydrocéphalie diagnostiquée pendant la grossesse. [Maternité de Paris.] *Ibid.*
22. Neugebauer, F.—Die Entstehung der Spondylolisthesis. Vorläufige Mittheilung. "Centralbl. f. Gynäk.," May 28, 1881.
23. Breisky, A.—Ein neuer Fall von Sectio cæsarea nach Porro's Methode mit günstigem Ausgang für Mutter und Kind. *Ibid.*, May 14, 1881.

24. Zweifel, P.—Zur Discussion über Porro's Methode des Kaiserschnittes. "Arch. f. Gynäk.," xvii, 3, 1881.
25. Felsenreich, T.—Beitrag zur Therapie der Uterusruptur. *Ibid.*
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27. Von Hecker, C.—Ueber einen Fall von spontaner kompleter Uterusruptur mit Ausgang in Genesung durch Drainage. "Centralbl. f. Gynäk.," May 14, 1881.
28. Shiland, A.—Inversion of the uterus. "Med. Annals," May, 1881.
29. Trush, J.—Concerning the prophylaxis of puerperal fever. [Obstet. Soc. of Cincinnati.] "Obstet. Gaz.," May, 1881.
30. Hyndman, J. G.—Antiseptics as a safeguard against puerperal fever. [Obstet. Soc. of Cincinnati.] *Ibid.*
31. Forster, E. J.—The necessity of the long nozzle in making intra-uterine injections after confinement. "Boston Med. and Surg. Jour.," May 12, 1881.
32. Harvey, T. P.—Puerperal embolism (?) with hæmorrhage; recovery. "Brit. Med. Jour.," May 21, 1881.
33. Wallis, F. M.—Case of extra-uterine fœtation. *Ibid.*, May 28, 1881.
34. White, J. P.—A case of extra-uterine pregnancy.—Tapping of sac.—Recovery. "Buffalo Med. and Surg. Jour.," May, 1881.
35. Thompson, M. H.—A case of prolonged gestation and unusual labor. "Med. and Surg. Reporter," May 21, 1881.
36. Ronaldson, T. R.—Note on a case of early viability. [Obstet. Soc. of Edinburgh.] "Edinb. Med. Jour.," May, 1881.
37. Champneys, F. H.—Second communication on artificial respiration in still-born children; the expansibility of various parts of the lungs. An experimental inquiry. [Roy. Med. and Chir. Soc., London.] "Brit. Med. Jour.," May, 1881.
38. Abegg, H.—Zur Verhütung der Augenentzündung Neugeborener. "Arch. f. Gynäk.," xvii, 3, 1881.

7. In M. Queirel's article on *varices during pregnancy* he suggests that the term varix should be limited to permanent dilatations of the veins, with alteration in their coats, while the temporary enlargments due to the embarrassment of the circulation produced by the pressure of the gravid uterus should be called phlebectases. Modern text-books devote too little space to this subject. The frequency with which varices are met with in pregnancy needs to be established by further statistics. The affection is no more apt to occur on one side of the body than on the other, nor does the attitude of the fœtus appear to influence its development. In fact, the author is inclined to refer its causation partly to a constitutional condition as well as to local influences. In no instance has he seen a woman affected with varices whose mother had not suffered in like manner. Although they usually make their first appearance after the third month of gestation, still there are women in whom they constitute the first sign of pregnancy—a proof that compression alone can not be the key to their pathogeny. After heredity, cardiac affections are the most common cause of varicose veins. As regards the influence of occupation, those employments that involve great exertion, fatigue, or prolonged standing, especially laundry work, are most apt to give rise to the affection. The notion, prevalent in the south of France, that the sex of the child affects the tendency to varix seems unfounded. If it be true that varices are not likely to form during old age, it is also true that those that have already formed do not disappear with advancing years. As to the effect of multiple gestation, it seems plausible, but, perhaps, authors have reasoned somewhat *a priori* in regard to it. Verneuil's statement that deep varices always precede those situated superficially is not always borne out, and the author thinks it probable that it is less often true of pregnancy than of other conditions. When varices depend upon local causes they should be treated with a view to cure, either by doing away with the cause or by acting directly upon the mobile vessels; when, however, they are connected with constitutional conditions, none but palliative treatment should be employed.

In view of the frequency of the affection and the few instances in which harm results, the prognosis is generally favorable; but, apart from the dangers of rupture and hæmorrhage, phlebitis, and the like, death of the fœtus may sometimes ensue, with consequent abortion. There seems to be no greater tendency to post-partum hæmorrhage among the subjects of varices than among other women, unless there are constitutional conditions present favoring the occurrence of hæmorrhage. The influence of the affection upon the patient's progress during the puerperal period is not very pronounced, phlebitis being almost the only accident traceable to it. Even this is generally superficial and devoid of special gravity. Thus far the author has been referring solely to varices of the lower limbs. In the main, what has been said applies also to those of the genitals. Vulvo-vaginal varices are frequently associated with hæmorrhoids or with old lacerations of the perinæum. Deep-seated varicose dilatations may be felt even upon the cervix uteri or in the vaginal culs-de-sac; but generally they are veiled by the diffuse tumidity of the parts. It is the frequency of œdema that has caused thrombus to be confounded with varix properly so called. Varices, · contrary to the general opinion, doubtless favor the occurrence of thrombus, although the latter seems to occur as often in cases in which there are no varices as in those in which they are present. Hæmorrhage from a thrombus during pregnancy, especially if it is deep-seated, may give rise to the suspicion of a faulty implantation of the placenta; hence great care should be taken in the diagnosis, and it may be necessary to use a speculum. When the rupture and consequent hæmorrhage occur during labor, the latter should be hastened in its progress. If the tumor is not yet ruptured, is not impeding the process of parturition, and is not increasing rapidly in size, it should be let alone; otherwise a large incision should be made, and pressure should be employed after turning out the clots.

9. The particular *complication of occipito-posterior positions of the vertex* to which Dr. Croom calls attention is an injury to the soft parts overlying the spine of the ischium when, as the result of want of flexion, the head becomes jammed more or less transversely. Four cases are given to illustrate the occurrence—two of them in one patient in different confinements. In one of them the expulsion of the child was accomplished without the use of the forceps, which shows the fallacy of attributing such injuries to the use of that instrument. In several of the cases post-partum retention of urine was observed, and the author thinks it was dependent upon the laceration. The injury was usually slow in healing, but in no instance did it give rise to serious trouble. The author thinks, however, that it increases the risk of septicæmia, and that it may prove the starting-point of a serious and long-continued parametritis. No doubt it is generally overlooked, since an examination made soon after delivery would probably fail to disclose the laceration, which in itself is likely to be quite small, the large subsequent breach of continuity being due to sloughing. His practice is to examine every woman on the tenth day after delivery. By this time the loss of tissue is readily recognized. He attaches great value to such an examination, as it may often enable the physician to give valuable advice. He thus states his conclusions: 1. A partially rotated occipito-position [*sic*] is the least common of the various forms of occipito-posterior position. 2. Such an occipito-posterior position is usually associated with a degree of minor disproportion of the pelvis. 3. A very frequent if not invariable result is the formation of a more or less deep vaginal sinus. 4. The situation of this sinus is over the right ischial spine. 5. The extent and depth of the sinus depend on the length of time that the pressure has been exerted; though a very short period of pressure is sufficient to cause a sinus. 6. These sinuses do not cause very much constitutional disturbance, and their existence is often overlooked because no vaginal examination is made. 7. The prevention of such injuries is to be found in an early use of the forceps.

13. Dr. Ashby thus concludes his instructive paper on *the management of the perinæum during labor:* 1. The question of support or non-support must be determined by the condition of the perinæum. 2. An attempt to preserve the integrity of the perinæum may, under some circumstances, be attended with greater injury to both mother and child than a rupture. The lesion of greatest consequence must be considered. 3. The forceps, carefully used, is of great aid in preventing lacerations, and should be employed to assist in extending and extracting the head, when the condition of the perinæum strongly opposes or arrests its passage. 4. The administration of ergot before the head has been brought to bear upon the perinæum may give rise to violent expulsive effort and force a rupture of this body. 5. Lacerations play an important part in the induction of bodily and mental disease, and should be recognized at the time of their occurrence, with a view of determining the necessity for surgical closure. 6. Perineal lacerations, even when simple in character, ought, as a rule, to be closed by primary union.

14, 15. In Sänger's remarks on *the immediate treatment of lacerations of the perinæum* he insists upon the free use of antiseptics. He considers strong catgut (No. 3) the best material for the sutures, even in cases of complete rupture. The patient should be anæsthetized and placed in the lithotomy posture. One needle with an endless thread is sufficient. In the after-treatment the perineal region should be thickly covered with salicylized wadding or carbolized jute, and the patient should be allowed to lie alternately on the side and on the back. To avoid stagnation of the lochia, the legs should not be tied together. Lateral incisions, for the purpose of preventing laceration, are a necessary evil, and should be avoided as far as possible, especially if deep enough to involve the constrictor cunni. When laceration takes place in spite of them, we have a three-lobed wound, the edges of which are very difficult to approximate nicely. The incisions should always be closed with sutures, but, if the constrictor cunni has been cut into, primary union can not be looked for, as muscular action will pull the surfaces apart. ═══ Veit argues in favor of the immediate application of sutures, but considers it important that they should all be inserted from the perinæum, paying little attention to deep lacerations of the vagina. Attempts to close the latter are seldom called for by reason of hæmorrhage, and are apt to result in shutting up putrescent secretions deep within the tissues, thus favoring the occurrence of septicæmia. He prefers silk as the material for the sutures, and does not think it necessary to induce constipation. Lateral incisions may be closed, unless by so doing an undue strain is put upon any central laceration that may have taken place, the latter being by far the more important.

17. Weis states that *the management of the placenta* was purely expectant in the obstetric clinic at Copenhagen, until September 1, 1877, and that since that time Credé's method of expression has been the rule in all cases. The records of the institution do not show that the dangers mentioned by Runge, as apt to attend the practice, have been encountered. On the contrary, post-partum hæmorrhage, which took place in 5·78 per cent. of all cases (exclusive of those of placenta prævia and abortion) under the expectant treatment, has occurred in only 2·30 per cent. since Credé's method was adopted. Manual separation of the placenta was formerly resorted to in 1·33 per cent. of the cases (excluding those of placenta prævia and abortion, as before), whereas it is now practiced in but 0·64 per cent. Retention of portions of the membranes or of the placenta, however, has increased from 1·78 to 2·30 per cent., but in only one case has hæmorrhage occurred as the result of a placental cotyledon being retained, and the total percentage of consecutive hæmorrhages has fallen from 0·77 to 0·32. This diminution in the frequency of late hæmorrhages, notwithstanding the more common occurrence of retention of fragments of membrane or placenta, may have been due, the author suggests, to the improved sanitary condition of the institution, in which severe cases of puerperal fever are now quite exceptional. Since February of the present year the practice recommended by Runge has been followed—that of postponing expression until fifteen minutes after the child's birth, merely holding the uterus under the hand in the mean time. This method has been employed in eighty cases, in the great majority of which the placenta was expelled in seven or eight minutes—that is to say, without expression. In two instances a piece of the chorion was torn off and had to be removed (in one case expression was employed); and in two instances there was severe hæmorrhage. More experience is needed with the method, however, before its merits can be fully ascertained.

19. Dr. Payne discusses *the physiological and remedial action of viscum album, or mistletoe*, in a remarkably well-arranged paper, founding his statements on experiments upon animals and on his own experience with the drug in the treatment of disease. The preparation employed was a fluid extract, of which each minim represented two grains of the drug. Mistletoe is an irritant to the gastro-intestinal mucous membrane. In cold-blooded animals it acts on the heart like digitalis, slowing its action by increasing the length of the diastole, and at the same time adding to the strength of its systole. In warm-blooded animals its action on the heart is more like that of belladonna, increasing both the force and rate of its action. In too large or too long-continued doses it exhausts the irritability of the cardiac motor ganglia by overstimulation, and thus causes paralysis. It stimulates the sympathetic, but exerts a paralyzing action on the spinal cord and the spinal nerves, destroying the reflex functions of the cord and lessening the electro-motor contractility of the muscles. Reasoning from the stimulant action of mistletoe on the sympathetic nerves, and from his own clinical experience with the drug, Dr. Payne is prepared to indorse the claims made for it as an ecbolic by Dr. Long, in the "Louisville Medical News" for 1878. Dr. Long claimed that it was far superior to ergot: (1) because it acted with more certainty and promptness; (2) because, instead of producing a continuous or tonic contraction, like ergot, it stimulated the uterus to contractions that were natural, with regular intervals of rest—consequently, that it was admissible in any stage of labor and in primiparæ; (3) because it could always be had fresh, did not deteriorate by keeping, and was easily prepared. Dr. Payne advises its use in those cases of post-partum hæmorrhage in which the loss of blood has been extreme, and the nervous shock so severe that we dare not give ergot, lest paralysis of the heart result. Moreover, it is surer to stop the flooding. It is also most efficient in cases of retained placenta after abortion. By stimulating the vaso-motor nerves, and thus causing contraction of the arterioles, it will do good service in cases of menorrhagia, metrorrhagia, and hæmoptysis. Its action on the heart indicates its usefulness in all diseases of that organ characterized by weak action and low arterial tension. We may expect benefit from it in those affections of the brain and spinal cord in which congestion is marked, and, by lessening the reflex functions of the cord, it may prove useful in the reflex convulsions of children, when they continue after the irritating cause has been removed. In a case of labor, Dr. Payne gave a fluidrachm of the fluid extract, and repeated it in fifteen minutes. In two cases of retained placenta his father used a strong decoction, in doses of half a teacupful. In two cases of metrorrhagia [cause not stated, although it is mentioned that in one of the cases the womb was much enlarged and retroverted, the os being patulous and soft and spongy to the touch] a decoction (mistletoe, ℥ ij; water, O.jss—boiled down to a pint and strained) was given in doses of one fluidounce every six hours. Both cases were severe, and other medication, including the use of ergot, had proved of no avail. Dr Daniel S. Hughes, of Philadelphia, employed the drug at the author's request, giving the fluid extract in half-ounce doses, repeating it in fifteen minutes. In all these cases its action was prompt and satisfactory.

20. M. Apostoli takes a somewhat rose-colored view of *the use of electricity in obstetrics.* His remarks apply to faradization exclusively, and may be summarized as follows: 1. Faradization of the uterus is always absolutely free from danger. 2. It is a trustworthy calmative and sedative. 3. It shortens the convalescence considerably, hastening involution, so that generally the fundus can not be felt above the pubes after the sixth or eighth day. 4. The resumption and regular exercise of all the functions is accelerated—urination and lactation being specially mentioned. 5. It guards the woman against all the uterine complications that result from parturition [meaning, apparently, *ulterior* uterine derangements]. 6. It is the true preventive treatment of uterine deviations, such as retroflexion or retroversion, after confinement. [This would seem to be included in the preceding statement.] 7. It has seemed to him to diminish the lochial discharge. 8. Under a given degree of faradization, the contractility of the uterus is quite variable, being in inverse proportion to its inertia. 9. As compared with ergot, its action is manifestly more prompt and energetic.

21. The case in which M. Tarnier made a *diagnosis of fœtal hydrocepha-*

lus before labor began was that of a woman whose abdomen was very large, its wall being thinned and traversed by numerous veins. There was no suprapubic œdema, and the lower limbs were but slightly œdematous. The digestive functions and those of the bladder were comparatively well performed. The uterus, situated in the median line, filled the abdominal cavity, its fundus extending beneath the false ribs. Manifest fluctuation led to a diagnosis of dropsy of the amnion at once. In palpation, the hand often felt that it displaced liquid before encountering the fœtal parts, which were very movable. The fœtal movements were very plainly to be felt and seen. It was observed that the fœtus made sudden and unusual movements. After displacing a layer of liquid, with both hands on the hypogastrium, a large, rounded body was felt above the superior strait, very hard and movable; this was the head. Occasionally a smaller prominence was felt on the left side, in the neighborhood of the head, and seemed to change places with the latter; this was the shoulder. Palpation revealed a flat, resisting surface in the right flank, consisting of the child's back, and, farther up toward the fundus uteri, there was an extremity, smaller, softer, and less regular than that which floated above the superior strait. The limbs were recognized anteriorly and to the left. Palpation, however, did not always furnish the same results. Sometimes the back, lying posteriorly, was not readily accessible, so that the limbs were almost the only parts recognized. On auscultation, the heart-sounds were heard at the usual distance, but their maximum was always to the right, above the umbilicus, sometimes in front, and again behind. On digital examination, the excavation was found empty, the head being situated very high. On the 18th of April, M. Pinard, who accompanied M. Tarnier in his visit, examined the patient carefully, and made out an unnatural size of the head, which conclusion he confirmed with calipers. He thought that the case was one of hydrocephalus, and on the 20th M. Tarnier confirmed this diagnosis. Between the blades of the calipers, placed transversely as regarded the mother's abdomen, the head measured 17 centimetres [6⅝ inches]; one blade was then introduced into the vagina and placed against the head, while the other was laid on the abdomen at the highest part of the head, and showed a measurement of 12½ centimetres [4⅞ inches]. The finger, introduced into the cervix up to the membranes, felt the head distinctly and its bony resistance, and, on displacing the head with the other hand, various parts of the bony surface were recognized by the finger, the edge of one of the cranial bones and a broad membranous space corresponding apparently to a widened suture. Delivery was completed on the 26th.

36. In Dr. Ronaldson's case of *early viability*, the author ascertained accurately the time of fruitful sexual intercourse resulting in the birth of a child, that proved viable, between the sixth and seventh calendar months of gestation. A young woman menstruated, for the last time before becoming pregnant, early in June, 1880—on the 3d or 4th, she thought. On the evening of the 25th of the same month, when expecting the return of her menstrual period (for she menstruated every three weeks), she had intercourse for the first time. Morning sickness began about sixteen days later. She could not tell the time of quickening. Labor set in on the 2d of January, and was completed at 5 P. M. on the 3d—192 days after the first coitus. The child was healthy, plump, and vigorous, and cried lustily, although small, weighing 3¾ lbs., and measuring about 17 inches in length. The nails were short and rather soft. The eyelids could be opened. The left testicle had descended into the scrotum, but the right one had not. When the case was related, the child was more than five weeks old, weighed 4 lbs. 9 oz., and measured 18 inches in length. The right testicle was then stated to be "in the spermatic cord." The child had lost its plumpness, but was lively and had every appearance of surviving. For about a fortnight after its birth it was fed on diluted cow's milk, being unable to suck the nipple. The author took great pains to ascertain the facts in the case, and he is confident that they are correctly stated. He suggests that the twenty-one-day type of menstruation may have had an influence in hastening the child's development, which was certainly more advanced than the text-books state to be usual between the sixth and seventh months. Coitus occurred immediately before, and the birth took place immediately after, what should have been a menstrual period, so that the mother missed ten periods.

37. In cases of *asphyxia neonatorum*, "Which part of the lungs of a child, that had been subjected to various methods of manipulation, was most frequently expanded, and which most frequently unexpanded?" was the question with Dr. Champneys. To answer it he had made a careful study of the lungs of children thus manipulated, but that had never breathed. Out of twenty-six fœtuses he excluded all but twelve, on account of direct inflation having been employed. The report summarizes the speaker's analysis of thirty-six cases selected from Schmitt's 101 cases, and of sixteen selected from Zerg's nineteen, as follows: In children dying soon after birth (1) the right lung was usually better expanded than the left; (2) the anterior surfaces than the posterior; (3) the lower lobes were the parts most often unexpanded; (4) the right middle lobe was usually well expanded; (5) the part of the left lung corresponding to the right middle lobe was often better expanded than the rest of the left lung. When the right middle lobe, on the other hand, was ill expanded, the corresponding part of the left lung was often unexpanded also. In children who had breathed naturally, the bases were often unexpanded; this seemed to correspond with the fact that the characteristic of feeble breathing in infants was feeble descent of the abdominal viscera, betokening feeble descent of the diaphragm. The author then gives his conclusions from his own experiments: (1) the right lung is more usually expanded than the left; (2) the anterior surface than the posterior; (3) the apices of the upper lobes are often unexpanded; (4) the anterior inferior borders the same; (5) one of the places of selection for atelectasis is a strip running vertically along the angles of the ribs on each side of the spine; (6) the patches of expansion or atelectasis, when considerable, are not confined to lobes nor bounded by fissures; (7) the last circumstance is not due to obstruction of the bronchi; (8) the spots of predilection for expansion or atelectasis underlie the regions of greatest and least movement of the chest walls. The speaker had no doubt that pneumothorax, which was found in some instances, was produced by Schultze's method of artificial respiration, which caused a considerable jerk. It was as easy to expand the lung of a child that had not breathed as that of one that had breathed; but a few breaths greatly modified the resistance of the lung, the opening of the air channels and the influx of blood producing a great effect.

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6. M. Tarnier thus describes a method of *exploratory eversion of the rectum:* the right index finger, with the nail cut short, is introduced into the vagina, and bent into the form of a hook so that its tip rests upon the recto-vaginal septum a short distance above the sphincter ani. The point of the finger is then pushed slowly and steadily backward and downward so as to depress the recto-vaginal septum forcibly and cause it to emerge through the anus.

Under this manipulation the perinæum soon bulges, the anus opens, and the rectal mucous membrane comes into view. On continuing the manipulation, the finger clears the anus and appears externally, covered with the rectal wall as with the finger of a glove. This eversion reaches about an inch above the anus, and allows of minute ocular examination of the everted mucous membrane. When the tissues are firm the manipulation sometimes fails, but with women who have borne children it usually succeeds readily, especially if no great length of time has elapsed since confinement. In one instance the author was obliged to desist on account of the pain complained of, which, although an unusual occurrence, might be obviated by an anæsthetic. [We give this description by M. Tarnier, thinking that some of our readers may not be acquainted with the method. It has, however, been in constant use in this country for many years past, having been brought prominently before the profession, if our memory is correct, by Dr. Horatio R. Storer.]

7. Dr. Wathen describes and figures a *urethral speculum and dilator* which, he claims, has certain advantages over all other instruments used for examining the urethra in women, especially in the matter of facilitating topical medication. It is trivalve, with the blades of strong steel and very small, being no larger, when closed, than a No. 6 catheter. The blades form a right angle with the handles, as shown in the cut, which also seems to show that dilatation is effected by approximating the handles, and maintained by means of a screw. When expanded to its full capacity, the instrument will dilate to the extent of 2 or 2½ centimetres in diameter, and will expose the mucous surface from the meatus externus up to the bladder. The urethra is always dilatable, the author remarks, and in an adult it may be dilated to a diameter of 2 centimetres without serious injury, except in the rarest instances. It is usually only where great carelessness is practiced that any serious results follow. The incontinence does not result directly from laceration, but from cicatricial union of the lacerated surface interfering with the proper coaptation of the longitudinal folds of the mucous membrane of the urethra, to which the retentive power is mainly due.

8. In Dr. Chapman's paper on the *treatment of incontinence of urine in women*, he refers not to cases in which incontinence is complete, but to those in which there is compulsory frequency of micturition and in which the capacity of the bladder is found to be less than the normal. A case is narrated in which, after the cure of a cystitis, the only remaining trouble was the necessity of emptying the bladder every hour, day and night, a little more than two ounces of urine being voided each time. Gradual forcible dilatation of the bladder was employed by injecting a warm two-per-cent. solution of carbolic acid. This was done daily, the injection being stopped when the patient's pain became great and when the resistance reached a certain point. At first only four ounces could be tolerated, but there was a daily gain of from a drachm to an ounce. On one or two occasions the fluid returned tinged with blood, but no harm ensued. When the treatment was stopped sixteen ounces could be injected, and the patient was obliged to get up only once or twice during the night, while by day she could retain her urine so well as not to be inconvenienced. Two months afterward there had been no recurrence of the trouble.

9. Dr. Erich describes a *new operation for laceration of the perinæum.* The perineal body, he thinks, is not like the triangular or pyramidal mass of tissue figured by Thomas and other authors, but a small, backward-curved mass composed of fat, connective and muscular tissue, and skin, and situated principally *below* the recto-vaginal septum, which latter enters very slightly if at all into its formation. In rupture of the perinæum, the author holds, the vaginal mucous membrane is torn off, more or less transversely, from the muco-cutaneous junction in front; the mucous membrane retracts, and, if the distention from the passing head or shoulders is sufficiently great, the perinæum is ripped open toward the rectum. In restoring it the problem is not as generally stated, but rather to raise and bring forward the floor of the vagina to its former level, and stitch it to the vulvar surface in front by means of sutures running inward from the ostium vaginæ on either side, and finally closing up the perineal rent by a row of superficial sutures. No deep perineal sutures, acting like a bag-string, are used. The sutures, of fine iron wire, are all passed superficially. With the patient in the exaggerated lithotomy posture of Simon, the cicatricial tissue is dissected up with sharp scissors until the surface is denuded to some distance beyond the cicatricial border. The denuded surface is then of a rectangular shape, with its longer diameter transverse. If the rent extends into the rectum, the edges are then pared and the rectum is first restored by passing the sutures from the rectal side. These rectal sutures, and also those in the vagina, are secured by means of the author's deep-suture stylets. The rectum having been made whole, the center of the vaginal mucous membrane at the denuded border is seized with forceps, and the floor of the vagina is raised and drawn forward to its normal level and attached to the denuded surface of the vulva. Interrupted sutures—all superficial—are then passed through the approximated edges until the seam is complete on one side. The surfaces on the other side are united in like manner, and the sutures are secured by the deep-suture stylets. The operation is then completed by a row of superficial sutures uniting the skin from the fourchette to the rectum. By the raising and drawing forward of the floor of the vagina, and uniting it with the vulvar orifice at its normal level, the anterior wall of the rectum is drawn forward, restoring the anterior curvature of the rectum, between which and the posterior commissure of the vulva all that can properly be termed the perineal body is situated. Dr. Erich claims for this operation, which he proposes to call colpo-perineoplasty: (1) that it restores the normal perinæum; (2) that it is simple and easily performed; (3) that it gives rise to but little pain after the operation, as all deep sutures and the tension which they produce are avoided; (4) that it is more apt to be followed by primary union than other methods of operating; (5) that the perinæum thus restored is very dilatable and not apt to give way in succeeding labors.

15. In the case of *peritonitis following the operation for laceration of the cervix uteri*, related by Dr. Reamy, the accident was supposed by him to be due to injury of vessels inflicted in dragging the uterus down, and not, as suggested by some of those who took part in the discussion, to a septic process.

16. Kocks's *antiseptic method of dilating the uterine canal* consists in inclosing the expansible material (laminaria, tupelo, or compressed sponge) in an India-rubber bag containing water, and inserting it, bag and all, into the canal. The vagina is previously disinfected. [This device is not a novelty, essentially the same thing having been described by Emmet and others.]

17. Dr. Snow gives three cases illustrating *the treatment of epithelioma of the uterus with perchloride of iron.* The first case was one of epithelioma of the fundus and cervix. A polypus-like growth protruded from the os uteri, attached to the cervix, just within the anterior lip. Part of the tumor was removed with an écraseur, but the disease extended far up within the uterus, and it was not possible to remove the whole of it. Two pieces of solid perchloride of iron, each about as large as a filbert, were passed up into the uterus and left to dissolve. A couple of sponges soaked in oil were left in the vagina for a few hours. The patient did well for twelve days, when a severe attack of pelvic cellulitis was brought on by exposure to cold. Nine months later the neoplasm seemed to have returned—there was a watery discharge, the os was very patulous, and a round granular polypus protruded slightly from the uterine cavity. ═══ The second case was one of epithelioma of the cervix (cauliflower excrescence). The cervix was short, and surrounding the os was a soft papillomatous mass, which bled and was adherent to the vagina posteriorly. As much of the diseased mass as possible was removed, and two pieces of solid perchloride of iron were placed in the vagina as high as possible. Three weeks afterward the perchloride was again applied. Two weeks later the margins only of the os were elevated and warty and bled easily. The application was then repeated, and again at the end of another fortnight. On examination, three weeks after the last application, the warty growth was found entirely replaced by healthy-looking cicatricial tissue, save one suspicious-looking spot, which was touched with potassa fusa. The patient was then discharged, but she died in about three months. ═══ In the third case (epithelioma of the cervix) the whole of the margin of the os was soft and spongy, and bled profusely when touched. Tissue of this character could be felt for about one third of an inch all round the outside and as far as the finger could reach within the uterus. Solid perchloride of iron was placed as nearly as possible in contact with the diseased structure, and retained in position with oiled cotton wool. The medication was repeated at weekly intervals for five weeks. After this the patient had fair health (suffering occasionally a little pain —relieved at once by morphia and belladonna) for three months, when hæmorrhage recurred, but ceased after one application of the perchloride, which was repeated a week later. Three months later there was a return of pain, with profuse watery discharge; there was irregular ulceration around the os, but no papillomatous growth, so the perchloride was not again applied. Dr. Snow remarks that this treatment is adapted only to papillomatous growths, for masses of soft spongy tissue, and that in the later stages of epithelioma, when ulceration has removed all the papillomatous tissue, it is of little use. The iron salt appears to "tan" the soft vascular fringes; its use is attended by little or no pain, and appears to be free from danger. This treatment is especially adapted to cases in which the uterine cavity is filled by a villous growth, and avoids all danger from the use of tents, as the os is usually patulous enough to allow the pieces of perchloride to be placed in contact with the growth. Staining of the fingers may be prevented by oiling them thoroughly.

21. In this article on *the operative treatment of uterine myoma* Mr. Tait declares his experience with enucleation and abdominal myomotomy to have been so unfortunate that he has given them up. He characterizes the former operation as most unscientific and altogether unjustifiable. As to abdominal hysterotomy, he has operated six times with only two recoveries, the latter occurring in cases in which he used his wire clamp. All the patients, three, in whom a ligature was applied to the pedicle died of continuous oozing from the stump, and he believes that no ligature will prevent this oozing if the pedicle is thick and œdematous. The remaining operation, that of removing the ovaries, he finds to be highly satisfactory. [This he calls "ovariotomy." The reader will observe that the term ovariotomy, as generally employed, refers to the removal of an ovarian tumor. It is a word that never should have been coined for any purpose whatever, but it has been so long in common use, and the meaning conveyed by it is so well understood, that we can scarcely hope ever to see it abandoned. This is the less to be regretted since the word "oöphorectomy," which it would otherwise be desirable to apply to removal of the ovary for any cause, has of late been employed to designate "Battey's operation"—the removal of the ovary for other reasons than disease of that organ itself.] Mr. Tait claims to have done the first oöphorectomies in England—the first one as early as the year 1871. He attributes only an historical interest to these early cases, however. In performing the operation he makes the smallest possible incision, often barely two inches long, and searches with the left fore and middle fingers for one ovary after the other. He does not remove one until he is satisfied that both can be removed. He transfixes the mesovarium with a hooked needle, and brings a loop of silk through. He then ties it by the special knot introduced by him some time ago, under the name of the "Staffordshire knot," which he has never found slip. He then cuts off the ovaries with scissors or knife, whichever is most convenient, and closes the wound.

22. Czerny regards the *enucleation of subperitoneal fibromyomata of the uterus per vaginam*, or vaginal myomotomy, as the most appropriate method of removing certain growths of this character. He refers to two instances in which a like method of operating was adopted in this country, by Dr. Sutton and Dr. Vanderveer, and gives two of his own; in one of the latter the tumor was situated in front of the uterus, and was reached by an incision between that organ and the bladder. This operation, he remarks, must be distinguished from the cervical (or endocervical) myomotomy previously in use. Small as clinical experience with the former has been, it is yet sufficient, he thinks, to show the extent of its applicability, which seems to be as follows: 1. We must first take into account the size of the tumor. Small tumors, not larger than one's fist, are particularly suitable for this method; the largest one yet removed weighed a pound. Inasmuch, however, as tumors weighing several pounds have been removed by the cervical method, it is quite likely that a similar extension of the range of this operation may be looked for; although

for the most part endocervical tumors are already modeled into a favorable form by uterine contraction before the operation, and the pelvic outlet is not infrequently enlarged. In the case of the latter, too, the steps in the process of fragmentation of the tumor may much more easily be watched than when it is attempted in the sub- or intra-peritoneal space by way of the vagina. 2. The tumors must have developed into the parametrium or into the subserous cellular tissue, in such manner as to be felt readily through the vaginal vault on bimanual examination. Pediculated subserous fibromyomata, projecting into the abdominal cavity, are generally better removed from above by laparotomy; still, we may imagine that under certain circumstances a small pediculated tumor of this sort lying in Douglas's space may be removed through the vagina with less shock to the patient, although, of course, it would involve opening the peritonæum. It will not infrequently be possible to remove tumors with a broad attachment without opening the peritonæum, as was attempted in both the cases related, although in one of them that membrane was injured. If this can be avoided, of course the danger is diminished. Prolapse of intestines may surely be avoided by previous purgation, by raising the pelvis at the time of the operation, and by inserting a disinfected sponge into Douglas's space as soon as the latter is opened. The wound of the peritonæum should be carefully stitched together whenever it can be assumed that no infective matter has entered the abdominal cavity. It is only when the peritonæum has been so extensively injured that suppuration is to be expected, that drainage and systematic irrigation of Douglas's space are to be advised. These rules the author has deduced from his experience in operations for cancer of the uterus and rectum. 3. The uterus, together with the tumor, should have a certain degree of mobility; and the separation of adhesions, particularly the enucleation, will be easy in proportion as the tumor can be brought into view. 4. Firm, fibrous, encapsuled tumors, with but few blood-vessels, are especially fitted for the vaginal operation. It is often impossible to ascertain these features; so it is well to bear in mind that a good result may follow the operation even when in this respect the circumstances are unfavorable. 5. Thus far, the posterior vault of the vagina has been opened for myomotomy three times, and the anterior vault once. We know that retro-uterine tumors are more common than those situated in front of the uterus, and that the topographical relations of the former are far simpler than those of the latter. Tumors that have developed laterally into the parametria must be much more difficult of removal. It will often be impossible to make out the situation of the ureters and the great vessels, and the question between laparotomy and the vaginal operation yet turns essentially upon that point. In cases of large tumors laparotomy is preferable, as it affords a better view of the field of operation. The author believes that, in well-selected cases, vaginal myomotomy is not a dangerous operation, and that, therefore, under certain circumstances it may properly be undertaken before the tumor has yet given rise to serious consequences. Subserous myomata of the cervix may often be diagnosticated early, and, whenever they seem fitted for the vaginal operation, should be the more promptly removed, since they cause serious effects within a comparatively short time. Without doubt, by carefully disinfecting the parts by antiseptic irrigation during the operation, and by afterward washing the wound with a five-per-cent. solution of chloride of zinc, much may be done to prevent those progressive inflammations which are otherwise so much to be dreaded after operations involving the subperitoneal cellular tissue.

QUARTERLY REPORT ON SURGERY.

No. VII.

By CHARLES B. KELSEY, M. D.,
SURGEON TO THE INFIRMARY FOR DISEASES OF THE RECTUM.

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4. Dr. Minor gives the clinical notes of a case of *traumatic tetanus successfully treated with astonishingly large doses of the extract of Calabar bean.* In less than twenty-four hours, during the height of the disease, one hundred and four grains of the alcoholic extract were given—the largest amount ever given, as far as the author's knowledge goes; and the result of the treatment, as we have already said, was successful. [We quote the case not only for its intrinsic interest, but also as showing the principles which guide the practice of the more advanced of our homœopathic brethren. The author of the paper in question has gained an enviable reputation not only as a bold and successful surgeon and practitioner, but as a leader among those of the homœopathists who uphold a rational practice of medicine, as distinguished from the exclusive believers in the ideas which up to the present time have prevented all fellowship between them and ourselves. It may be said that giving one hundred and four grains of extract of Calabar bean is not homœopathy, but, be this as it may, the giving of drugs on scientific principles is the *practice* of the best of that school to-day. There have been changes with them since the time when their founder taught that the best way of getting the utmost effect of a drug was to smell of its weakest possible dilution.]

10. Mr. Yeo gives in this paper the results of the experiments undertaken under the auspices of the Scientific Grants Committee of the British Medical Association, to determine *the applicability of the antiseptic method of dressing to the brain and meninges.* The questions to be determined were: 1. Is the inflammation which so constantly follows exposure of the cranial contents caused by septic agencies, and is it prevented by their exclusion; or can other causes be assigned for this inflammation, such as the so-called general infection? 2. What is the effect of strong carbolic solution (1 to 20) on the meninges? Of twenty-six cases of brain injuries produced in animals, only seven deaths occurred from all causes; and four of these may be omitted as depending on causes other than the operation or the method of dressing. The intense cold of the winter of 1879–'80 may have caused the death of three of the animals, one of which survived the operation thirteen days without inflammation, and, therefore, the case may fairly be considered a successful one as far as the antiseptic method is concerned. One death is assigned to chloroform. This can not be wondered at, since it is necessary to keep the animal profoundly anæsthetized during the whole time of the operation; and when the bone is being cut respiration becomes very feeble, and often ceases, so as to make it necessary to suspend the operation and resuscitate the animal. Of the remaining three fatal cases, one was caused by hæmorrhage six days after the operation, and no trace of inflammation could be made out. Another animal died from shock, and only one from inflammation. Hence, in fact, twenty-one of the animals lived long enough for the full development of inflammation. Of these, twenty were treated successfully with antiseptic dressings; and one animal removed the dressings and had to be treated in the ordinary way. Among the cases treated antiseptically, there was not one case of inflammation; and where this method could not be used there was intense encephalitis. Or, if these numbers be reduced to a percentage, 100 per cent. under antiseptic dressings were cured without any inflammation of the meninges, and 100 per cent. without antiseptic dressings died of acute encephalitis.

13. The following case is of interest as showing a possible *danger of applying perchloride of iron within the nose.* The patient was a man fifty-five years of age, who was troubled with frequent epistaxis, for the relief of which a tam-

pon soaked in the perchloride of iron was applied by a druggist, and a few drops of the same given internally. This treatment was twice repeated before the patient entered hospital, where he was tamponed for a subsequent hæmorrhage. Four days later he died with brain symptoms and signs of suppuration in the pharynx and nasal fossæ. At the autopsy the dura mater and arachnoid over the right cribriform plate of the ethmoid were found discolored by the perchloride of iron, but there were no signs of meningitis. The nasal fossæ were full of pus, and the mucous membrane was gangrenous.

15. Mr. Morris gives the notes of six cases of *removal of naso-pharyngeal polypi*, with some interesting remarks. He points out six different methods of removal. 1. Simply by the nasal forceps used through the anterior nares. 2. By the wire écraseur used through the nose, even when the tumor is too large to be drawn out through the nostril in the noose of the instrument. 3. By seizing the polypus at the back of the palate and twisting it off with a pair of tongue forceps or with the fingers and thumb in the mouth. 4. After slitting up the lip and the ala of the nose and enlarging the anterior aperture of the nostril by clipping away the margin of the nasal process of the superior maxilla. 5. By the method employed by Syme in 1841, and by Flaubert and Mott in 1842, of laying open the nose by an incision from the angle of the orbit, round the wing of the nose, and through the mid-line of the lip, and then dividing the suture between the nasal bone and the nasal process of the superior maxilla, and turning the nasal bone with the integuments covering it toward the median line. 6. By excision of the whole or a great part of the upper jaw. The author believes that by one or other of these methods all cases may be dealt with more efficiently than by having recourse to the practice of the permanent ligature, or of dividing the soft palate, or of splitting the nose along one side of the median line. All these three measures have had their advocates; yet the permanent ligature is fraught with danger of blood poisoning, besides being a source of prolonged inconvenience and even disgust to the patient; and division of the soft palate, or of the nose along its median line, has the great disadvantage of failing in its chief object, that of affording sufficient increase of room—and in this respect, if we may compare small things with great, it is about on a par with the Sigaultean operation as a substitute for craniotomy or the Cæsarean section. These methods excepted, it will be well in naso-pharyngeal polypi, as in operations on the tongue, to vary the plan of procedure to suit the conditions and necessities of each case, and not to adopt any particular method as the best for all cases. The operation which promises to allow of the most complete removal, and which at the same time least interferes with the surrounding normal parts, is the one which should be selected, just as in cases of cancer of the tongue, the mode of operating ought to be decided upon only after regarding the extent of the disease, together with the size of the aperture of the mouth, and the space afforded by the size or absence of the bicuspid and molar teeth. To do too much because of some prejudice in favor of some particular operation is unjustifiable; to do too little for the same or other reasons is to sacrifice the interests of the patient.

23. Mr. Spanton, in remarking on several cases of *removal of the tongue for cancer*, finds that the average duration of cases not operated upon is forty-two weeks, while that of those in which operation has been resorted to is eighty-six weeks, the longest reaching six years. Sir James Paget mentions an instance of even longer immunity than this. He believes that pregnancy and suckling almost invariably hasten the progress of the disease, although theoretically such conditions might be supposed to have the opposite effect. Having decided upon the removal of the organ, various methods present themselves, the chief of which may be divided into four groups. 1. Removal through the mouth. 2. By an opening below the chin. 3. By dividing the lower jaw. 4. By combining tracheotomy with the third method. Considering the last first, the author is decidedly opposed to it, believing it to add unnecessarily to the danger and to fulfill no good purpose. He does not believe that the wound made by the excision of the tongue is likely to cause blood poisoning, but believes that when such does occur the unnecessary compound fracture of the jaw is to be held accountable. Regarding the third method, which was devised by Sédillot, and improved upon by Syme, the author thinks it may sometimes, but can not often, be necessary. The second operation has many advocates, among whom was the late Mr. Nunneley, who was content with a small opening, through which he passed the écraseur, and his cases seem to have been very successful. Mr. Barwell claims for his modification of this method that it is painless, as he takes care in the earlier stages of it to divide the lingual gustatory nerves. Various ways have been adopted for performing the first class of operations. The knife is the surest and most expeditious, but not the safest instrument. It necessitates abstaining from an anæsthetic, and, under any circumstances, its use is liable to be attended with dangerous hæmorrhage. Even the galvanic cautery has been followed by severe hæmorrhage. The éeraseur seems on the whole to be the best instrument, and the incision into the floor of the mouth should be large enough to permit the tongue to be drawn fully forward.

32. M. Verneuil called attention to the matter of *cyanosis in cases of strangulated hernia*, which generally terminated fatally with symptoms of pulmonary congestion. In seeking for the cause of this condition, and of the fatal termination, he had discovered one fact which, though not proving much, pointed directly to the kidneys as the seat of the difficulty. He had recently been called to operate in a case of strangulated hernia of thirty-six hours' duration, in which there was very marked cyanosis with lowering of temperature. He reduced the intestine, which was congested, and stimulated the patient with injections of ether, etc. During the first few hours following the operation the temperature rose, and the cyanosis disappeared. On the next day the abdomen was swollen, there was no vomiting, but the passages were not reëstablished, the patient having only passed gas per anum. In the evening attacks of suffocation came on, and death followed thirty-four hours after the operation, with symptoms of intense pulmonary congestion. At the autopsy there was no trace of peritonitis, and nothing had justified the idea of its presence during life, but there was congestion of both lungs to a remarkable degree; the liver and spleen were healthy, but the kidneys each presented marked signs of advanced Bright's disease. The lowering of temperature, the almost complete anuria, and the lesions of the kidney, all supported the belief that the patient had died of uræmia.

38. Mr. Cripps showed a series of microscopical sections illustrating the development of *cancer of the rectum.* As stated in his writings on this subject, he had found all tumors in this locality developing on one type—that of adenoid tumor, and when he used the word "cancer" in this relation, he wished to be understood in this sense. A rectal growth originated in two ways. In one case it started in the submucous coat; and later on the mucous membrane gave way, so that, by subsequent partial destruction of the growth, a crater-like cavity was formed, while the growth extended at its margins. In the other case the growth formed a projecting tumor from the first. Tumors of this class were clinically innocent, and had been called papillomata; while the growths of submucous origin had been known as epithelioma; but every intermediate form was found. A slowly growing adenoid tumor of the rectum showed, on section, numerous cavities lined by cylindrical cells; that is to say, the tumor was of the glandular type. In a rapidly growing tumor the section showed fewer spaces of the same kind, lined by an epithelium of very embryonic type, with much embryonic tissue in the intervals between the cavities. If a section of the growing margin were examined, it was found to be exceedingly irregular, having, roughly, a tree-like or undulating form. The cavities above referred to were formed by the coalescing of these various processes. Looking at the surface with the naked eye, these rough, leaf-like processes could be seen. The cavities formed by the coaleseing of the branches of the processes were obliterated by pressure or filled up by growths which projected into them. These secondary growths were thus formed: Two or three epithelial cells outstripped their neighbors in growth; they proliferated, and so formed dendritic offshoots. The fibrous tissue in these offshoots Mr. Cripps believed to be derived from the walls of the cells. He believed that, for the purpose of this inquiry, the columnar epithelial cells might be looked upon as independent organisms; and he was of opinion that their nuclei subdivided, and then migrated into the subjacent retiform tissue, underwent there a development into leucocyte-like cells, and passed thence into the lymphatics. One of the sections, he thought, showed evidence of this. If the leucocytes were really developed from the columnar epithelium, it was not difficult to understand how the growth might extend in the deeper tissues by the throwing off of these young cells, and their subsequent development into epithelial cells. In growths in the liver, secondary to rectal cancer, the structure had been seen to have a distinctly glandular type; and he believed that one of these leucocyte-like cells might reach the liver by the ordinary channels, and there undergo the natural development toward a glandular type. The great question remained: What was the cause of this growth in the rectum—this adenoid growth, as he believed it always to be? To his mind, the only satisfactory explanation was to assume that these embryonic offspring of the epithelial cells had, in themselves, some infective property. ==== Dr. Thin thought the sequence of these growths had been admirably traced by Mr. Cripps, who had done for cancer of the rectum what Waldeyer had done for cancer of the breast, and Thiersch for cancer of the lip. This was now the third time he had heard, at that society, the startling theory that fibrous tissue could be developed from epithelial cells. But, after careful examination of the specimens shown now and on previous evenings, he entirely differed from the upholders of this theory. As to the relation of the nuclei in the retiform tissue to the epithelial cells, he believed that the nucleus represented a cell. The suggestion that the epithelial cells shed their nuclei into the connective tissue did not commend itself to many. He believed that the leucocytes, which were represented in the drawings by their nuclei, when they came in contact with the cancerous elements, underwent morbid changes which ended in their transformation into epithelial cells; if, before complete transformation, they were swept away, and then arrested in other organs, they might act as infective agents in the latter.

57. Trendelenburg has made an *ingenious application of the elastic tourniquet of Esmarch to amputation of the hip joint.* It consists simply in passing a large needle armed with elastic cord in front of the joint, and tying it before cutting the anterior flap; then disarticulating and repeating the same procedure behind before cutting the posterior flap. By this simple device he has rendered the operation entirely bloodless.

59. Dr. Murdoch's paper is a strong *plea for immediate amputation after injuries*, that is, during the first few hours. He thinks shock has been the great bugbear which has prevented surgeons from amputating early enough to save their patients. He believes this condition does not always exist even after very grave injuries, and is often delayed. He quotes McLeod, Lidell, Ambroise Paré, Wiseman, and Larrey in support of this idea. The statistics of the Western Pennsylvania Hospital, where immediate amputation for injury is the rule, show a lower rate of mortality for amputations than can be found elsewhere. Primary amputations in general show the following mortality:

Thigh	65·7	per cent.
Leg	43·9	"
Arm	28·0	"
Forearm	8·4	"

At the Western Pennsylvania Hospital the mortality is for the

Thigh	37·0	per cent.
Leg	13·22	"
Arm	0·0	"
Forearm	0·0	"

The number of cases in the latter hospital is not large enough to make the comparison fair, but the figures are given for what they are worth.

QUARTERLY REPORT ON DERMATOLOGY.

No. VI.

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5. Heppel, C.—Preliminary note on a new abortive treatment of erysipelas. "Arch. of Dermat.," Apr., 1881.
6. Braithwaite, J.—Treatment of frequently recurring erysipelas of the face. "Brit. Med. Jour.," Apr. 30, 1881.
7. Ravogli, A.—The nosology of roseolæ. "Cincinnati Lancet and Clinic," Apr. 9, 1881.
8. Stone, E. R.—Rötheln, or German measles. "Med. and Surg. Reporter," Apr. 30, 1881.
9. Rohé, G. H.—Urticaria. "Maryland Med. Jour.," May 15, 1881.
10. Gaucher, E.—Note sur l'anatomie pathologique de l'eczéma. "Ann. de Dermat. et de Syphil.," Apr., 1881.
11. Squire, B.—On the treatment of impetigo larvalis by powder of iodoform. "Brit. Med. Jour.," May 14, 1881.
12. Charteris, M.—Chrysophanic acid and psoriasis. "Lancet," Apr. 23, 1881.
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16. Crocker, H. R.—On the contagium of impetigo contagiosa. "Lancet," May 21, 1881.
17. Aubert, P.—Rôle du traumatisme dans l'étiologie de la teigne faveuse. "Ann. de Dermat. et de Syphil.," Apr., 1881.
18. Purdon, H. S.—The treatment of favus. "Arch. of Dermat.," Apr., 1881.
19. Startin, J.—Tropical ringworm or skin fungus. "Lancet," May 7, 1881.
20. Gerlier.—Sur l'épidémie tricophytique de Ferney-Voltaire. "Lyon Méd.," Apr. 24, May 1, 1881.
21. Chandelux et Rebatel.—Note sur un cas de lupus de la face.—Examen histologique. "Ann. de Dermat. et de Syphil.," Apr., 1881.
22. Riehl, G.—Ueber die Anwendung des Jodoforms bei Lupus vulgaris. "Wien. med. Woch.," May 7, 1881.
23. Thin, G.—Malignant papillary dermatitis of the nipple and the breast tumors with which it is found associated. "Brit. Med. Jour.," May 14, 21, 1881.
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28. Behrend, G.—Beitrag zur Pathogenese und Behandlung der Acne disseminata und der Sycosis. "Dtsch. med. Woch.," May 14, 1881.
29. McKew, D. I.—On sweating in certain animals. "Maryland Med. Jour.," July 1, 1881.
30. Saundby, R.—Three cases of excessive sweating. "Med. Times and Gaz.," May 14, 1881.
31. Dumas.—Observation de chromidrose. "Gaz. Hebdom.," Apr. 8, 1881.
32. Mitchell, W. T.—Case of hæmatidrosis. "Ohio Med. Recorder," May, 1881.
33. Collier, J.—On the causation of alopecia areata, and its occasional co-existence with tinea tonsurans. "Lancet," June 11, 1881.
34. Smith, W. G.—Two cases of fragilitas crinium (E. Wilson). "Arch. of Dermat.," Apr., 1881.
35. Heitzmann, C.—Experiments on epilation. *Ibid.*
36. Kaposi, M.—Ueber ein neues Heilmittel—Naphtol—gegen Hautkrankheiten. "Wien. med. Woch.," May 28, June 4, 11, 1881.
37. Duhring, L. A.—An improved diachylon ointment. "Phila. Med. Times," May 7, 1881.

4. Mr. Smith, in discussing *the local treatment of acne*, groups cases as follows: 1, Those in which retention of sebum (comedo) is a prominent feature; 2, those in which an inflammatory process predominates; 3, those in which vascular congestion requires to be specially dealt with. In the indolent papular form of acne the writer applies carbolic acid sparingly to the lesions by means of a glass rod, and prefers this to the acid nitrate of mercury. It effects a rapid absorption of unsightly acne pimples, without leaving a permanent mark. In applying the acid, a piece of blotting-paper should be at hand to remove any accidental excess of acid that might fall upon the skin. It is advisable to cover each carbolized spot with a film of flexible collodion. In cases of irritable or inflamed acne nothing is so soothing to the skin as washing the face with rice milk, prepared by boiling a teaspoonful of ground rice in half a pint of new milk. ═══ Smith advocates the use of *local calomel fumigation in certain diseases of the skin and mucous membrane*, having been struck with its rapid and satisfactory effect. A description of the apparatus used is given.

5, 6. As *a new abortive treatment of erysipelas*, in other words, to check the extension of a patch, Dr. Heppel recommends brushing the boundary line and the parts extending a finger's width on either side of it with a ten-per-cent. alcoholic solution of carbolic acid, until the integument thus painted shows a decided discoloration. The application is agreeable to the patient, and in seven cases, according to the writer, it has led to an abrupt termination of the erysipelatous process. ═══ As a local application for facial erysipelas, Mr. Braithwaite recommends a solution of tannic acid in alcohol and water, of a strength of from six to twelve per cent. This should be painted over the affected part with a soft brush every two or three hours. The writer claims that it will always arrest a threatened attack.

8. Stone, in a well-written, article on *Rötheln, or German measles*, emphasizes the following points in differential diagnosis: In measles there is a well-marked premonitory stage of catarrh; in Rötheln the eruption appears at the same time as the catarrh. The papules of measles are larger and redder, and arranged in a crescentic form; those of Rötheln, smaller, paler, and grouped in round or oval spots. The fever of measles is marked and persistent until the fading of the eruption; that of Rötheln is absent, or slight, subsiding in a few hours. There is well-marked desquamation in the one; very little, if any, in the other. The eruption of Rötheln disappears in from one to two days; that of measles lasts for four days. The distinction from scarlet fever is plain, for, at least at this time, Rötheln has no marked similarity to it.

9. Rohé recommends as *an antipruritic lotion in chronic urticaria* a drachm of benzoic acid in a pint of water.

11. Dr. Squire uses *iodoform in crusted pustular eczema* (impetigo larvalis) *of the face*, either pure or diluted with an equal part of starch powder, which lessens its irritating action, and renders it a comfortable application. His plan is as follows: 1. The scabs are to be softened by bathing them with soap and warm water, and then completely detached and removed; and thereupon the raw surface is to be gently dabbed dry. 2. The iodoform is to be in very fine powder, and freely dusted on. 3. A layer of glycerine is to be lightly laid over it with a camel's-hair brush. 4. The process should be repeated, if possible, every two hours.

12. In regard to *chrysophanic acid in psoriasis*, Mr. Charteris, having noticed that the ointment, applied to only one side of a psoriatic patient, apparently produced a beneficial effect upon the patches on the other side, undertook the following experiment to determine whether the acid had been accidentally rubbed upon both sides, or whether it affected remote patches by absorption. The right lower extremity of a psoriatic patient was enveloped in cotton wool and flannel from the upper part of the thigh down to the ankle, while the chrysophanic-acid ointment was applied to the remaining extremities. After ten days it was found, on taking off the bandages, that the limb to which no acid had been applied was notably improved, though to a less degree than the other parts.

17. M. Aubert claims an important part for *traumatism in the causation of favus*, and cites cases showing that the development of the parasitic disease has usually been preceded by some blow, cut, or other injury to the scalp, or by the existence of pediculi capitis.

20. M. Gerlier, in reporting an extensive *epidemic of trichophytosis* (ringworm) which originated in a barber's shop, quotes the experiments of Vincens in the transmission of the disease to cats. To favor the contact of the parasite, he cut the hairs with scissors and applied the parasite in both water and glycerine. The success of these experiments was only moderate, but, when a portion of the cat's skin was shaved with a razor charged with the trichophyton, the inoculation was certain. This result he attributes to the previous softening of the skin by means of the soap lathering, the removal of the outer cells of the horny layer of the epidermis, and the exposure of the granular layer in which the spores of the parasite germinate. [The mediate contagion admitted by the writer would seem to be a more common mode of propagating the disease in a barber's shop. The danger to be apprehended from an infected razor is slight as compared with the possibility or almost certainty of contracting ringworm from the damp and soiled towel which is not infrequently used, and which furnishes the exact conditions for the luxuriant growth of a fungus.] According to M. Gerlier, the ringworm which is transmitted to the human species from the lower animals presents certain peculiarities. The eruption is vesiculo-squamous, the skin is unusually reddened, and there is a marked tendency to sycotic or kerionic development. Ringworm transmitted from the horse is more contagious and more obstinate than that transmitted from the cow. In the cure of the disease the writer disparages the value of the ordinary parasiticides, and insists upon a phlogistic treatment. For ringworm of the body a superficial caustic, such as nitrate of silver, is recommended; for the sycotic or kerionic form, the application of oil of cade and epilation; for ringworm of the scalp, friction with a solution of corrosive sublimate (10 per cent.) until crusts are produced, or vesication with croton oil. The patient with an affected beard should avoid shaving, lest an accidental cut should convey the spores to a deeper portion of the hairs, and thus produce the sycotic or kerionic form.

22. In claiming a value for *iodoform as a remedy in lupus*, Riehl justly remarks that the main principle of treatment should be to spare the healthy tissue. Hence mild cauterization, puncture, scarification, and scraping are to be preferred in most cases to extirpation by the knife or by a powerful caustic. The numerous mild caustics employed in the treatment of lupus possess one quality in common, viz.: a tendency to produce superficial sloughing and suppuration, after which a scar is formed by granulation. Iodoform, on the contrary, checks the suppurative process, and the lupus patch heals by gradual absorption of the diseased tissue. After a trial of this remedy in twenty cases, the writer recommends it as extremely efficacious, and gives the following method of application: The diseased skin, first freed from greasiness by means of a vigorous soap friction, is painted with a solution of caustic potash (one part in two of distilled water). After the lapse of from one half to two minutes the epidermis will appear swollen and transparent, and the further action of the caustic should be checked by the application of water. Upon the raw patch now produced finely-powdered iodoform should be strewn to a thickness of one or two millimetres, and the part covered with cotton and strips of plaster. This dressing may be removed in from three to eight days. In all the cases treated by the writer in this manner no pus was found upon the removal of the dressing. The iodoform was seen in the pits caused by the absorption of the lupus nodules, and the swelling and redness had mostly disappeared. In severe cases this proceeding was repeated two or three times before the lupus infiltration was entirely gone. The application of the iodoform to the raw skin occasioned no pain nor any unpleasant sensation, and the suggestion is offered by the writer that, in cases where the lupus has not already ulcerated, the pain of the cauterization of the skin may be alleviated by means of local anæsthesia.

23. Thin gives the name *malignant papillary dermatitis* to that obstinate affection of the skin of the areola and nipple which has been observed to precede the development of cancerous tumors of the breast, and which has been described as "eczema of the nipple."

28. In a paper on *the cause and treatment of acne and sycosis*, Behrend states that it is too common a custom in Germany to regard all skin diseases as local affections, due to external injury and having their origin in the cutaneous tissue. This he declares to be one cause of the frequent failure to cure the diseases above mentioned. Another cause exists in the fact, that in these glandular affections the mere presence of one lesion tends to the production of others by the pressure which it exerts upon neighboring glands. This pressure is greatest at the surface of the skin, where the connective tissue is dense. It occasions a closure of the duct and a stasis in the vascular network of adjacent glands. Local treatment becomes imperative, therefore, as a means of removing the accumulated sebum and pus which exist in the deeper portion of acne and sycosis nodules. The ordinary applications of soap, sulphur, mercury, iodine, etc., are powerless to effect this result, and the writer therefore recommends not only the free incision of large and chronic nodules which is commonly practiced, but a somewhat analogous treatment of small and recent lesions. The large nodules having been opened and their contents let out, the whole of the affected skin is scraped with tolerable firmness by means of the sharp spoon or dermal curette. This procedure tears off the projecting portion of the lesions, opens the compressed orifices of the sebaceous ducts, and gives free exit to their retained secretion. Numerous small erosions upon the site of former lesions, and a trifling hæmorrhage, are occasioned by the scraping. Every three days the operation should be repeated, and the thin crusts which have formed upon the erosions must be scraped away each time. After one or two repetitions, the lesions will be observed to have decreased in number and size, and fewer erosions will be occasioned by the scraping. ══ In the treatment of sycosis the writer attaches far more importance to the frequent use of the curette, taking care each time to scrape away the crust and to lay bare the follicular orifice, than to the frequent use of the razor. By scraping and epilation combined he has obtained much better results than by his former practice of shaving, epilating, and applying ointments. The pain occasioned by the operation is said to be slight, and to grow less with each operation. [In the treatment of acne the foregoing plan is without doubt an efficacious one, and superior to the ordinary soap-friction treatment, but only in a limited class of cases. It might be employed with advantage in those cases in which the disease has existed for a long time in a severe yet indolent form, and in which the glandular disorder is a prominent feature. But, in a large majority of the acne cases which are seen by the physician, especially in private practice, simple hyperæmia surrounding the gland, without suppuration, is the chief feature of most lesions, and the function of the glands is not disturbed to the extent which the writer considers to be an essential element of acne. These are the cases, most common in females, in which the face flushes upon the slightest provocation, and a new crop of lesions appears in connection with every menstrual period, or with any slight gastric irritation. Comedones may be present without evincing any tendency to become inflamed, and often the glands proper seem entirely unaffected in spite of the surrounding inflammation. This is especially true as regards lesions of short duration (acute acne). Local treatment in these cases must be of the most soothing character, or it will certainly aggravate the condition of the face, and a resort to the scraping treatment described above would be as uncalled for as it would be in a case of urticaria. In treating acne it is important to bear in mind the fact that there is an indolent type of the disease, characterized by glandular distention and the formation of minute dermic abscesses, and also an irritable type, in which acute congestion is the main symptom. It is only in the former class of cases that harsh local treatment is advantageous. As to the effect of scraping in sycosis, we can not speak from experience, but should be inclined to think that without epilation it would not suffice, and that with epilation it would be superfluous.]

29. Speaking of *sweating in certain animals*, in a discussion on scarlatina and the treatment of hyperpyrexia, Dr. McKew made some remarks upon the unfitness of dogs and rabbits for experiments as to the effects of external heat upon man, on account of the absence of perspiration in these animals. In order to substantiate his statements he offers some instructive references to literature bearing upon this question. From the quotations given, it would seem that rabbits, dogs, cats, and mice do not sweat when subjected to a high temperature, although provided with imperfectly developed glands over the hairy portions of the body, and especially upon the hairless surface of the paws. The writer remarks that clinical experience has repeatedly recorded temperatures of the human body far beyond those which experiments upon brutes have declared fatal.

30. Mr. Saundby's three cases of *excessive sweating* presented certain features in common. The patients were males of middle age, all of intemperate habits, and subject to more or less gastric trouble. In one case, which was very severe, the attacks never came on during sleep. In another, the attacks invariably came on during sleep. Atropia was given with apparent success in two cases, but the third was only benefited after the administration of compound ipecacuanha powder.

31. M. Dumas reports at length a case of *chromidrosis*, occurring in the person of a young boarding-school miss, who, in the heat of a discussion, received the contents of an inkstand upon her right cheek. Two days afterward an attack of hysteria occurred, and a brownish patch appeared upon the cheek, corresponding with the spot from which the ink had been washed. After ten or twelve days another attack of hysteria occurred, with a reappearance of the patch. This, when seen by the writer, presented at first glance a dark-gray appearance, but on closer inspection was seen to consist of black points on a brownish background. A dull pain, at times lancinating, existed in the patch, and extended over the side of the head. The patch was so hyperæsthetic that the patient would not allow it to be touched with the finger. Bromide of potassium, and afterward Fowler's solution, were prescribed. The patch (which was evidently the result of exudation) faded, or even disappeared, and returned at intervals of eight to twelve days, and no connection between these morbid phenomena was apparent. The menstruation remained regular throughout, but there was excessive tenderness in the right ovarian region. The patient improved under treatment, and was well in four months. [The question might arise as to the propriety of applying the term chromidrosis in this case, since no examination of the sweat was made. A pertinent suggestion is offered by the editor of the "Gazette Hebdomadaire," that, in consideration of the hysterical condition of the patient and her positive refusal to allow her physician to touch the patch, the case may have been one of malingering. The writer's conviction that arsenic benefited his patient seems based upon his belief that chromidrosis is one of the "modalities of herpetism," and, therefore, ought to be benefited by arsenic, rather than upon the facts of the case.]

33. As regards *the etiology of alopecia areata*, Collier objects to the statement that trichophytosis (tinea tonsurans) may insidiously produce a smooth, bald patch; and, while admitting that alopecia areata and trichophytosis may coexist upon the scalp, claims that there is no connection whatever between these two affections. He reports cases in which the bald patches developed immediately after local injury, and remarks that, if we inquired into the history of every case of alopecia areata, we should find the cause to be essentially nervous in its character.

34. Dr. Smith reports two interesting cases of *fragility of the hairs* upon the right side of the upper lip, those of the scalp being quite unaffected. The patients were medical men who resided in the same house, and one appeared to have contracted the affection from the other in consequence of having used his hair-brush. In each case the hairs were of variable length, the shorter ones presenting frayed ends or a black terminal knob. There was no history or indication of parasitic disease in either case, and the normal growth seemed to be restored by the application of a simple ointment.

36. Kaposi calls attention to *the value of naphthol in diseases of the skin*, and, from the success which he reports as having followed its use in upward of a hundred cases, it seems quite probable that a new and valuable substitute for tar has been discovered. The value of tar in certain conditions of desquamative inflammation of the skin is well known to every one who has had the opportunity of seeing skin diseases treated in Vienna, or who has had much experience in the treatment of skin diseases elsewhere. Its efficacy, which can not be denied, depends, according to Kaposi, upon its action in penetrating the skin, contracting the paretic and distended vessels, and promoting resolution of the sub-inflammatory condition of the papillary layer, thereby lessening speedily the accompanying pruritus. Believing that some one of the numerous constituents of tar would probably exert a similar beneficial action upon the diseased skin, and at the same time be free from the unpleasant features of the time-honored remedy, he selected naphthol for experimentation (the B-naphthol of the chemists—$C_{10}H_8O$). This is soluble in dilute alcohol, or in oil, and hence is capable of being applied in either solution or ointment. Kaposi employed a solution, varying in strength from ½ to 10 per cent., and an ointment of from 1- to 15-per-cent. strength, which he terms "unguentum naphtholi simplex." In the treatment of scabies he employed an "unguentum naphtholi compositum," prepared according to the following formula: ℞. Naphthol, 15 parts; lard, 100 parts; green soap, 50 parts; prepared chalk, 10 parts. This ointment not only killed the acari and destroyed the cuniculi, but had a beneficial effect upon the inflamed and eczematous portions of skin. As this salve, moreover, had no marked odor, and did not stain the skin or the clothing, it was considered to be an improvement upon the remedy commonly used, , viz., Hebra's modification of Wilkinson's salve (sulphur, tar, soap, and lard). In psoriasis a 15-per-cent. ointment of naphthol produced a speedy disappearance of the lesions. As no staining of the skin or hair attended its use, its advantage over chrysophanic acid, and its adaptability to lesions of the face and scalp, were quite apparent. In the treatment of eczema in its squamous stage, or in a persistent papular form, a naphthol lotion of ¼- to 2-per-cent. strength was found to produce the beneficial effects of tarry applications. In one case of erythematous lupus a cure was effected, but in lupus vulgaris the naphthol proved of no value.

37. Dr. Duhring recommends the following formula for *an improved diachylon ointment*: One part of freshly precipitated (from acetate of lead), pure white hydro-oxide of lead is rubbed with two parts of water, and mixed well with six parts of the best Lucca olive oil. It should be stirred for about two hours over a hot-water bath, near the boiling point, and cooled with constant stirring until the proper consistence is obtained.

QUARTERLY REPORT ON ORTHOPÆDIC SURGERY

No. V.

By CHARLES T. POORE, M. D.,
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3. Parker, R. W.—Remarks on the curvature of the long bones in rickets. "Med. Times and Gaz.," Apr. 2, 1881.
4. Cabot, A. T.—A case of posterior torticollis. "Boston Med. and Surg. Jour.," May 19, 1881.
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6. Owen.—Quiet vertebral caries. *Ibid.*
7. Richardson, B. W.—Vertebræ in process of disintegration by caries not necessarily accompanied by pain or tenderness in the overlying soft structures. "Med. Press and Circ.," Mar. 23, 1881.
8. Hayden.—Lumbar caries; paraplegia. [Path. Soc. of Dublin.] "Brit. Med. Jour.," Apr. 23, 1881.
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12. Hill, B.—Case of fracture of the lower dorsal and upper lumbar vertebræ, treated with Sayre's jacket: recovery with only slight deformity of the spinal column. [Clin. Soc. of London.] "Brit. Med. Jour.," Mar. 26, 1881.

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18. Haberern, J. P.—Ueber Beckenabscesse bei Coxitis und ihre Behandlung. "Centralbl. f. Chir.," Apr. 2, 9, 1881.
19. Judson, A. B.—Considerations respecting the mechanical treatment of hip disease, with especial reference to the value of traction. "St. Louis Courier of Med.," May, 1881.
20. Chapman, N. H.—A point in the treatment of hip-joint disease. "Chicago Med. Jour. and Exam.," Apr., 1881.
21. Ollier, L.—De la résection de la hanche au point de vue de ses indications et de ses résultats définitifs. "Rev. de Chir.," Mar., 1881.
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24. Corley.—Exsection of the hip joint. "Brit. Med. Jour.," Apr. 2, 1881.
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5. *The early diagnosis of caries of the spine* has not been sufficiently studied, and its symptoms are often misinterpreted by general practitioners, the diagnosis not being made in many cases until the spine has become deformed; thus valuable time is often lost. Although angular curvature is proof positive that caries is or has been present, and although no other single sign has the same force, there are other symptoms, variously combined, which are quite sufficient to establish the existence of caries before any trace of angu-

lar curvature has been developed. The first of these symptoms is pain; sometimes it is constant and severe, either at the seat of disease, or radiating to more or less distant parts. In some cases it is paroxysmal, and resembles severe cramp; while in some it is slight and is suggestive only from the situation in which it is felt, and its combination with other symptoms. In disease involving the first two cervical vertebræ, it is referred to the occipital region of the scalp, in the course of the first and second occipital nerves. Pain in this region, associated with any stiffness or altered manner of carrying the neck, must always raise a strong suspicion that cervical caries is present. In other regions of the spine the pain is felt at or below the point of disease. Pain attending caries in the lower cervical region radiates over the shoulder and down the arms, and sometimes over the front of the chest, at the upper part. When the dorsal spine is affected pain is felt round the sides of the thorax—sometimes on one side only, sometimes on both—or at the middle line in front. When the lumbar spine is involved, pain spreads over the loins and pelvis and down the lower limbs—sometimes as far as the knee, and even to the feet. Pain in any of these locations is relieved by rest in the horizontal position. Pain may be confined to the sciatic nerve of one side alone, or may be complained of in one knee, thus simulating the pain of hip-joint disease. In the author's experience the feeling of constriction—as if a cord were drawn tightly round the abdomen—which is put down in books as a common symptom of caries, though it is occasionally met with, is so comparatively rare that its absence is worth nothing as evidence that the spine is sound. Pain in coughing, sneezing, or traveling in a car or carriage, in making a false step in walking, or in lifting any heavy object, especially if the dorsal or lumbar spine is affected, is of much value in making a diagnosis. The jarring of a vehicle will often cause pain when careful walking does not. The second order of symptoms by which caries of the spine, in its incipient stage, may be recognized refers to the degree in which the column retains its natural mobility. The following points should be noticed: Whether, while standing with the heels together and keeping the knees straight, the patient can stoop without restraint, so as to bring the tips of the fingers toward the toes; whether he can stoop freely and raise himself freely, in the act of picking up some small object from the floor; whether he can raise himself easily from the recumbent to the sitting or upright posture; and whether in these various exercises all parts of the spine are seen to contribute their proper share of movement, or whether any part is kept rigid while movement is free above and below it. If the cervical region be suspected, besides the usual flexion and extension movements, the patient's power of nodding and rotating the head must be observed. His manner of walking must be scrutinized, to see whether the spine moves in all its parts, or whether any region is kept stiff. Especial attention should be paid to the manner in which he turns round. In picking up any small object from the floor, if the spine be sound, the patient will stoop and raise himself without a pause; but, if mischief be present, these proceedings are often characteristic. If his disease is acute he will probably give up the attempt. If he perseveres he will probably place himself so that the object is at one side, and slowly approach it by bending, not the spine, but the knee, while the former is held rigid and perpendicular. In children the mode of rising from a recumbent posture is peculiar—they slowly move around until they get on their hands and knees, and then carefully get up. Thirdly, especially in children, in whom a diagnosis of disease must often be made, not by observing two or three conclusive signs, but by fitting together numerous small fragments of evidence derived from different sources, the suspicion that caries is present is strongly confirmed by the observation that the patient has some device for relieving the spine of part of the work of supporting the weight of the head and trunk. Thus, in disease of the cervical spine, he may rest his chin on his hand, or support his head with his hands, especially in the effort of rising from the recumbent posture. Others, who have disease in the dorsal or lumbar region, have the habit of making their way to a chair, on which they place the palms of their hands, and over which, with their arms straight, they lean. Another posture, very suggestive of mischief, is that in which the patient, having slightly flexed one knee, so that the limb rests on the toes, places his hand on the middle of the thigh, and then leans over to that side, so as to convey weight from the shoulder through the arms to the thigh. The author states that there are some tests of spinal caries in use which seem so untrustworthy that he feels justified in offering a strong caution against their use. These are: (1) the plan of tapping with the knuckles, or dealing a slight but sudden blow with the closed hand, on the spinous process of the suspected vertebræ; (2) another symptom, on which some observers lay much stress, is tenderness or increased sensitiveness found over the spinous processes corresponding to the carious vertebræ; and he has seen this over-sensitiveness searched for by means of a hot sponge. He believes this test is quite untrustworthy. Tenderness, or over-sensitiveness, is a very common feature in cases of hysterical spine, and certainly tenderness is often absent when caries is distinctly in progress. The period at which angular curvature becomes apparent in the course of spinal disease varies with the form that the caries takes. In instances in which inflammation involves the general substance of the body of one or more of the vertebræ, and is attended with rapid softening and absorption, angular curvature very soon results. But in some cases inflammation is limited to the external surface of the bodies of the vertebræ and their investing ligaments. Here extensive ulceration may take place, and even lead to the formation of abscess, before angular curvature ensues.

23. The report of the committee appointed to inquire into *the value of excision of the hip joint in childhood* is of interest. The points specially investigated were: (1) The indications for the operation; (2) its results; (3) the method of operating; (4) the nature of the disease. In 45 cases treated by excision there was a total mortality of 35·5 per cent. from causes connected with the disease; 13·4 per cent. from some form of tubercular disease; the average duration of treatment was 1¾ years; the average shortening amounted to 2¾ inches; while the movement at the hip was free, limited, or *nil* in the proportion of 11, 6, and 3. In 260 cases of suppuration treated without excision there was a mortality of 30·4 per cent. counted as above stated; 9·2 per cent. from tubercular disease; an average period of treatment of 2½ years, with an average shortening, in 33 cases, of 1·6 inches; and in 35 cases 30 patients walked with slight or no limp; the movement was free, limited, or *nil* in the proportion of 5, 4½, and 3. In 124 cases without suppuration the total mortality was 10·5 per cent., 7 per cent. from tubercular disease, and the movement was free, limited, or *nil* in the proportion of 5, 3, 3; in 17 of these cases the average shortening was 1·4 inches; and in 1 case there was an apparent lengthening of ¾ inch; of 22 of the patients, 19 walked well, and 3 limped. Sequestra were found in 59 per cent. of the specimens of the disease examined. Of the total of 203 cases of excision collected from various sources, 13·7 per cent. of the patients died directly from the operation. The pathological indications for the operation are stated to be necrosis of the head of the femur, or the formation of large sequestra, extensive caries of the bones, intrapelvic abscess from acetabular disease, and long-continued suppuration. The clinical indications are rapid onset of suppuration, with severe local and constitutional symptoms, general albuminoid disease, and long-continued suppuration in spite of other treatment. Pelvic disease is no bar to the operation. The mortality from tubercular meningitis, in cases of excision, was 4·4 per cent.; in other cases of suppuration, 6·1 per cent.; in cases without suppuration, 5·6 per cent. Of 429 cases, 9 per cent. of the patients died from some form of tubercular disease. The limb is generally less useful after excision than after other modes of careful treatment. Only the diseased bone should be removed, and the great trochanter only when diseased or when there is extensive disease of the pelvis. While the occurrence of necrosis is shown to be proportionately very great, clinical records show that in many instances these sequestra are small, and either come away by themselves or are very easily removed.

26. Mr. Bryant's case of *reproduction of the upper part of the femur after removal for necrosis* was that of a girl aged six years. The disease had been acute necrosis of the femur, with suppuration of the hip joint, following an attack of acute periostitis. At the time of the operation the only evidence of periosteum was seen at the lower neck of the dead shaft, which was surrounded by an ensheathing casing of new bone. After the operation everything went on well. In less than a month the wound through which the bone had been removed had quite healed. It was found that after three months there had been complete re-formation of the bone that had been removed, with a new joint. This was demonstrated by the smooth movements of the limb—flexion, extension, adduction, and rotation of the limb existing at the time the case was reported almost as perfectly as they did in the sound joint.

29. In this case *the advantage of free incisions in acute inflammation of the knee with suppuration*, the joint cavity being then washed out with carbolized water, and Lister's dressing applied, is well illustrated. The patient was a man of 28 years of age who had had for ten years an osteitis near the epiphysis of the right femur, followed by an acute inflammation of the knee joint. In one month he regained good power of motion at the knee.

33. The following case of *acute osteitis* is reported. The child (aged 14) belonged to a family in which the father died of phthisis, and one brother had hip-joint disease. Three months before, the patient had received an injury to the right knee, since which time the leg and joint had, from time to time, been painful, but, until a few days before admission, he had been able to walk about. He was then seized with intense pain in the knee and the upper part of the leg. The swelling was hard, brawny, and intensely painful. The temperature was high, and the patient complained of great pain in his head. Three days later he became delirious, the heart's action was feeble, and the tongue was dry and brown. The next day an abscess was forming over the front of the sternum. A free incision was then made down upon the upper portion of the tibia, and on passing a director toward the epiphysis pus escaped. The patient remained in a very precarious condition for about a month, when he was put under ether and the whole shaft of the tibia was excised, from a point two inches above its lower extremity, the upper portion of the diaphysis being separated from the epiphysis by inflammatory action. From the time of the operation the boy's health began to improve; a new tibia formed, and, although the leg, after eight months, was two inches shorter than its fellow, he was able to walk about with the aid of a high-heeled boot. On making a longitudinal section of the shaft of the tibia immediately after the operation, the whole of the cancellated structure of the shaft was found to be full of offensive pus. The outer surface of this shaft was covered with a thick periosteal growth of new osseous tissue.

34. A boy, twelve years of age, was treated for *acute osteitis.* Five days before coming under observation he had fallen on the ice. He was delirious, with his face flushed, sordes on the lips, and complaining of pain in the back of his head. There was a tender spot over the upper part of the left rectus. There was a slight fullness just below the left hip, on the outer side. There was also slight swelling of the right knee. An incision was made over the tender point in the left femur down to the bone. No pus was found, but, on making a linear osteotomy with a Hey's saw, about one drachm of pus escaped. The trephine was then used in order to give free drainage. Incisions were also made over tender spots on the right tibia and fibula, but no pus was found. The temperature in three hours fell to 97·4° Fahr. On the following day the temperature rose to 103°, but fell again on changing the dressings. In the evening he again became delirious, there were signs of purulent collections in other parts of the body, and he died two days later unconscious. On post-mortem examination, a small abscess was found over the cartilages of the lower ribs, and a thick layer beneath the sternum, in the mediastinum, and over the heart. The internal organs were congested, and there was an intussusception of the small intestine. On section of the upper part of the left femur, the upper part of the medullary canal and the cancellous tissue immediately above were found much changed, and the bone softened by the acute endosteitis.

35. Mr. Gould's case of *death after antiseptic osteotomy* was as follows: A healthy boy, aged eight years, was operated on for a bad rickety deformity of the tibia at 2 P. M. on October 27, 1880. Strict antiseptic precautions were observed. The bone was divided with a chisel. He slept through the night, and next morning was free from pain. At 11 A. M. he was nauseated, and vomiting and diarrhœa continued through the afternoon and evening, when collapse set in, and, in spite of vigorous stimutating treatment, he died 36½ hours after the operation. There had been total suppression of urine since early morning. At the autopsy the blood generally was fluid and dark; in the largest veins were partially soft clots. The spleen, the liver, the heart, and the brain were healthy. The trachea and bronchi were intensely congested. On microicopic examination, the minute pulmonary vessels were found to be filled with blood clot, and minute foci of commencing inflammation were found scattered through the parenchyma. Similar foci were found in the kidneys. The wound showed no unhealthy appearances; the medulla of the divided bone was not crushed, and no sign of fat embolism was anywhere apparent. It was remarked that the clinical and pathological features of the case excluded, as the cause of death, shock, anæsthesia, and the acute specific diseases, but that they pointed to the presence of some intense irritant in the blood. Mr. Gould concluded that the case was one of carbolic-acid intoxication, and he was led to this view from the absence of any other cause of death and of any fact to negative it; and because the symptoms and post-mortem signs, with few exceptions, were those observed in that affection.

36. Mr. Bennett reports three cases of *osteotomy*, as follows: I.—The patient was a boy, 4½ years old, with an anterior curvature of both tibiæ. Mr. Bennett removed a wedge-shaped piece of bone from one tibia, and then straightened the limb, using strict antiseptic precautions. The wound healed in three weeks, and there was no suppuration—this left one limb longer than the other; he, therefore, performed a similar operation on the other limb. In both limbs a satisfactory result was obtained. ═══ II.—A girl, eleven years old, had fallen, when two years of age, and fractured her elbow. The limb was fixed at a right angle; there was hardly any motion except those of pronation and supination; nor would the atrophied muscles respond to the interrupted galvanic current. There was strong bony anchylosis at the joint. An osteotomy was performed, and, although passive motion was persisted in during the healing, the arm some time after the operation reverted to its angular and immovable state. ═══ III.—A sailor, aged thirty-two, fell and broke his thigh four inches below the great trochanter. The bone had united with great deformity, the fragments forming an angle of 115°. An incision was made through the bone so as to bisect the salient angle formed by the fragments, and this was effected with difficulty, owing to the enormous thickness of the bone, which was completely divided across, the operation occupying an hour and a half. There was but moderate suppuration, and the temperature for a few days was above normal. In six weeks the patient sat up, and soon got on crutches. He could now walk well. The limb was one inch shorter than the other. A small opening allowed minute fragments of bone to escape from time to time. [In regard to regaining any motion at a joint after an osteotomy for anchylosis, we do not know of a single case on record in which it has been permanently maintained, or in which a section near a joint has been followed by any useful motion.]

38. Mr. Macewen's case of *transplantation of bone* was as follows: In the "Glasgow Medical Journal" for May, 1880, Mr. Macewen reported the case of a boy on whom he had operated for necrosis of the humerus. The whole shaft had died, and, after separating the epiphyses, the bone was removed subperiosteally. New bone was produced at both the upper and the lower portion, but there was a gap remaining where no bone had been reproduced. The limb was useless. He proceeded first to make a groove in the soft parts in the position of the bone, and then placed in this groove small fragments of wedges of bone removed from other patients for curved tibiæ. The grafts were thus taken from six wedges of bone removed from six limbs of patients, and were reduced to very small fragments previously to insertion. Proper care was taken throughout to have the parts perfectly aseptic. The shaft has been completely restored, and the humerus measures only one half inch less than the other in length.

39. Mr. Tyson's case of *cross-legged progression* was that of a man, sixty-seven years of age, who, at the age of fourteen, fell and injured the right leg; this accident kept him in bed for four months. From this time he could never go astride a horse. Sixteen years ago he began to have difficulty in walking, his legs becoming more and more approximated; the last fifteen months he had walked cross-legged. The latter position was maintained day and night. With some force the legs could be unlocked and brought parallel, but not without causing pain. There was only the slightest motion in each hip joint; the surrounding bone appeared thickened. Both extremities were extremely adducted and everted—the heels far apart, and the toes close together; the legs crossed one another just above the knee joint, the right one being in front. The hip joints were the only joints affected in the body; the knee joints could be fully flexed. He could walk with two sticks very slowly, and for a short distance. The knees were hardly moved in progression. Mr. Tyson explains the deformity in the following manner: In the original accident some injury to the right hip joint occurred, and during its repair adduction of the right thigh took place; this condition, then, would naturally account for the difficulty he had, as soon as he was able to move about, of sitting across a horse's back. The right hip became anchylosed; and, as time went on and the right limb became more adducted, there was a tendency for the left one to pass across to the right side in order to maintain equilibrium; and, as movement in the left limb became less, so anchylosis would gradually come on here, and thus, after a time, both hips would become fixed, the movements lost in these joints being supplied to a great extent by a complementary movement occurring in the lower part of the spine. In two cases of this deformity presented by Mr. Lucas at a meeting of the Clinical Society, October 22, 1880—one in a boy, aged ten years, the other in a man, forty-seven years of age—there was anchylosis of both hip joints, but the disease had existed some time in one hip joint before the other had become affected. In walking, the knee joints were used, while in the case reported by Mr. Tyson these joints were held strongly extended. In a discussion as to the cause of this deformity, three theories were advanced: 1. Adduction, in which the malposition was attributed to the unopposed action of the adductor muscles during the process of repair. 2. Gravitation. It was suggested that the first hip became anchylosed in an adducted position, and then, when afterward the patient walked with the aid of crutches, the other limb fell naturally across the one fixed, in order that the line of gravity might be between the two. 3. The optional, which induced the patient to choose by preference a position that gave most rest to the inflamed hip, and afterward led him to maintain or even increase the deformity, because the position was one which allowed most easy progression.

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Miscellany.

OPHTHALMOLOGICAL NOTES.*

Loring's Keratometer. — Loring's keratometer ("Trans. of the Am. Ophth. Soc.," 1880), designed for measuring the curvature of the cornea, "consists of a metal disk, in which are set a number of plano-convex lenses of various curvatures, on the plane or posterior surface of which the representation of the iris is painted. The lenses are, in fact, anterior sections of artificial eyes of different curvatures. The radii of these artificial corneæ range from 8·5 to 6 mm. The principles upon which the instrument is based are: first, that the eye is capable of detecting very minute differences in the size of two adjacent bodies, the exact dimensions of which the mind is unable to estimate accurately; secondly, that the size of an image from a convex surface is proportionate to the radius of curvature. The application of these principles consists in comparing the image of the glass cornea, which has a known radius, with that from the real cornea, which is unknown; or, in other words, in matching the image of the real with that of the artificial eye. The patient is placed in a chair opposite an ordinary window-sash, and the observer, standing a little on one side, places the disk in close application to the outer angle of the eye to be examined. Should the image from the glass selected not correspond in size with that from the cornea, the observer then rotates the disk until the image from the glass is of the same size as that from the eye. Loring says that the instrument has proved of practical advantage in high degrees of astigmatism, and in some cases of great amblyopia, where, by its use, it was at once shown that the condition of the cornea had nothing to do with the defect in vision. It ought also to be of use in solving the question in a given case, whether the myopia or hypermetropia is corneal or axial, and also whether the astigmatism in a given case, if of a considerable degree, is corneal or lenticular.

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* Laid over from Dr. Bull's Quarterly Report in the July number.—*Editor.*

Galezowski on Ophthalmia Neonatorum.—Galezowski ("Ann. de Gynéc.," Mar., 1881) discusses the methods which should be employed in avoiding the dangers of infantile ophthalmia. He considers that ophthalmia of infants is a disease transmitted solely by inoculation from the vaginal secretions, and that it can be cured only by an energetic local treatment. To this end he deems necessary the cauterization, twice a day, of the conjunctival surface of the lids with a forty-grain solution of nitrate of silver. He thinks that the physicians of the various wards or districts of a city should be charged with the duty of examining the eyes of new-born children, and that the parents should be compelled to have them properly treated from the first day of the appearance of the disease.

Kipp on Malarial Keratitis.—Kipp thinks ("Trans. of the Am. Ophth. Soc.," 1880) that keratitis from malarial fever is of frequent occurrence. It is commonly developed within a few days after an attack of intermittent fever, often simultaneously with the appearance of herpetic vesicles on the nose or lids. In some patients every fresh attack of the fever is followed by this corneal affection. In the majority of cases only one eye is affected. The keratitis is generally of the ulcerative variety, but the ulcer is confined to the epithelial layer, and shows no tendency to increase in depth. The process of repair is extremely slow.

Tuwim on the Innervation of the Iris.—Tuwim ("Arch. f. d. gesammt. Physiol.," xxiv, 3, 4) takes up the subject of the physiological relation of the superior cervical ganglion of the sympathetic to the iris, and draws his conclusions from his own experiments upon animals. When the ganglion is removed on one side, and on the other side the sympathetic nerve is divided before it enters the ganglion, the dimensions of the pupil are always smaller after the operation than before; but the pupil of the side on which the ganglion was left intact was always larger than on the side from which the ganglion was removed. He considers that the superior cervical ganglion exerts a tonic influence upon the nerve fibers which pass to the iris and dilate the pupil. When the ganglion is removed from one side, the pupil on this side is always wider than on the side not operated upon. When the sympathetic nerve is divided just before it enters the ganglion on one side, and all the communicating branches except the carotid nerves, on the same side, are also divided, the pupil of the side on which the iris nerves were still connected with the ganglion, the latter being isolated from its central nerve connections, was always narrower than the pupil of the other side. When the ganglion of one side was removed, and the sympathetic nerve of the other side divided before it entered the ganglion, as well as all the communicating branches, except the carotid nerves, the pupil on the side from which the ganglion was removed was always wider than that on the other side. In warm-blooded animals the superior cervical ganglion exerts a nutritive influence upon the corresponding iris nerves even after complete division of all its cerebro-spinal branches of communication. Tuwim also concludes that the nerve branch connecting the superior cervical ganglion with the hypoglossal nerve does not, even in warm-blooded animals, convey any nerve fibers to the superior cervical ganglion which cause dilatation of the pupil.

Adamük on Choroiditis Disseminata.—From careful observation and analysis of forty cases of choroiditis disseminata, Adamük ("Centralbl. f. prakt. Augenheilk.," Mar., 1881) draws the conclusion that the disease is generally of congenital origin, and for the following reasons: 1st, It is often accompanied by retinitis pigmentosa; 2d, in both these diseases hemeralopia is often a prominent symptom; 3d, these eyes often show other congenital changes, such as cataract; 4th, choroiditis disseminata is often present in several members of the same family, often alternating with retinitis pigmentosa; 5th, the patient may have retinitis pigmentosa in one eye, and choroiditis disseminata in the other; 6th, the result of both these diseases is an atrophic change in the nerve elements of the papilla and retina; 7th, mercury produces the same results in both diseases, at first improving the subjective sensibility without any ophthalmoscopic change; 8th, Both diseases are equally progressive and incurable.

POUSSON ON PUERPERAL CHOROIDITIS.—In his paper upon a case of puerperal purulent choroiditis, Pousson ("Arch. d'Ophth.," Jan.–Feb., 1881) dissents from the embolic theory of its causation; first, because of the necessary crooked and direct course of the embolus through the lung in order to arrive at the capillary system; and, secondly, because in the region obstructed by the embolus there results necrobiosis rather than suppuration. Pousson suggests that the cause should be sought in the presence of low organisms in the blood. He examined the flood, the liquids of the suppurating eye, and an abscess in the hand of his patient, for the presence of these microbia, with all the precautions indicated by Pasteur. He found the blood very pale, the corpuscles limited in number and altered in shape, large numbers of micrococci, some isolated and some arranged like short strings of beads. The purulent contents of the eye showed long strings of these beads, as did also the pus from the abscess in the hand. Pousson suggests that, if these micrococci, transported by the blood, meet in their course with a vessel obliterated by thrombus or embolus, they will be stopped at this point, and form deposits which will become the point of departure for abscesses. As regards treatment, Pousson advises that, as soon as an eye becomes red and painful, local and general antisepsis be instituted. Cataplasms of solutions of phenic acid should be used on the genital wound, which tend to destroy the germ of the disease. Applications of boracic acid should be made to the eye, which, though they may not exert any influence upon the micro-organisms before the membranes of the eye are perforated, will certainly tend to destroy them when suppuration has once occurred.

LANDOLT ON THE FUNCTIONS OF THE RETINA.—Landolt (*Ibid.*, Mar.–Apr., 1881) gives the results of his investigations as follows: There exists an essential difference between the functions of the central portion and those of the eccentric portions. While the light sense remains constant as far as the limits of the parts of the retina sensible to light, the color sense, while preserved as far as these same limits, diminishes rapidly from center to periphery; and the form sense, or the perception of form, diminishes in a still more marked degree than the color sense, and at 50° has ceased to exist.

FERRIER ON CEREBRAL AMBLYOPIA AND HEMIOPIA.—Ferrier ("Brain," Jan., 1881) considers that the clinical history and morbid anatomy of cortical lesions do not give direct support to the localization of a visual center in the regions indicated. The evidence in favor of a cortical visual center in man is mainly of a constructive character. In cerebral hemianæsthesia of organic origin, depending on lesion of the posterior segment of the internal capsule external to the optic thalamus, vision is affected in a very distinct and special manner. In the classical form of this affection vision is greatly impaired, if not temporarily entirely abolished, on the side opposite the lesion; the field of vision is greatly contracted, and there is impaired color perception. In discussing the subject of the course of the optic-nerve fibers, Ferrier affirms that clinical observation in man places the fact of semi-decussation of the optic tracts beyond all doubt. The cross amaurosis or amblyopia which has been found to result from lesion of the angular gyrus is entirely in harmony with the affection of vision usually seen in cerebral hemianæsthesia. It would, therefore, seem that the fibers which pass to the cortex in the posterior segment of the internal capsule are those which are specially in relation with the angular gyrus, and represent the opposite eye as regards those functions which are affected in hemianæsthesia. The possibility of the occurrence of a cross affection of vision from a cerebral lesion is therefore established, both experimentally and clinically. Ferrier also considers it highly probable that pressure on the optic tract is the cause of the temporary hemiopia described in connection with apoplectic extravasations existing along with conjugate deviation of the eyes. The hemiopia is on the side opposite the lesion. It is also very probable that a cerebral lesion in the occipito-angular region may cause hemiopia, altogether apart from direct or indirect implication of the optic tract or corpora geniculata. A temporary functional disturbance of this region appears also most satisfactorily to account for the scintillant scotoma. In cases where central vision is retained for some degrees on all sides of the point of fixation, Ferrier regards the cause of the hemiopia as cerebral. The angular gyrus of each hemisphere has a bilateral relation with the center of the retina, so that, notwithstanding the complete destruction of the visual center in one hemisphere, central vision is possible with both eyes through the sound angular gyrus. Hemiopia may, therefore, exist on the side opposite the lesion, with retention of central vision in both eyes. The area of central vision is more extensive in the eye opposite the sound side, but central vision, more or less, is still possible, though the opposite center has been destroyed. The facts relating to cerebral amblyopia in connection with lesion of the posterior segment of the internal capsule seem to show that the duration of visual defects in man is much greater than in the monkey. The prognosis, therefore, in cerebral hemiopia is generally unfavorable.

MARCKWORT ON LESIONS OF THE OPTIC NERVE.—Marckwort's investigations ("Arch. f. Augenheilk.," x, 3) were made mainly upon dogs. His experiments consisted in dividing the optic nerve, with and without division of the central vessels without division of the nerve; in compression of the optic nerve; and in ligation of the optic nerve. When the optic nerve was compressed, after division of all the muscles, nerves, and vessels, a very extensive cloudiness of the retina ensued rapidly, due to a serous infiltration, which only occurs when, under normal pressure, the blood is suddenly brought to complete stasis in the vessels. This cloudiness, from its rapid appearance and disappearance, must be situated in the vascular layer of the retina. When the compression was suddenly relaxed, hæmorrhages occurred, usually at the point of curvature of the vessels. When the optic nerve and vessels were divided, marked narrowing and even obliteration of the retinal vessels occurred, but within an hour they had almost regained their normal caliber. Marckwort found fewer choroidal changes by this experiment than other authors, due to the fact that there was but little injury done to the nutrient vessels of the eyeball. The atrophy of the retina and optic nerve, after division of the nerve and central vessels, was very complete. In all the various experiments the condition of the pupil, as well as that of the sensibility of the cornea, depended upon the amount of injury done to the ciliary nerves. If the optic nerve were divided without injury to the ciliary nerves, the pupil remained proportionately wide.

PONCET ON DIVISION OF THE OPTIC AND CILIARY NERVES.—Poncet ("Arch. d'Ophth.," Jan.–Feb., 1881) discusses the proximate and late changes which occur in the eye after the operation, the dangers resulting from the operation, and the best manner in which to do it; and then draws his conclusions as to the whole subject. He experimented upon the eyes of rabbits, frogs, and dogs, and examined the eyes microscopically four, eight, twelve, and thirty days, and six and eighteen months after the operations. Comparing these results with what he found in human eyes after similar operations, he concludes that the consequences of optico-ciliary neurotomy in animals are less extensive than those following the same operation in man. He finds a marked difference between the changes in the coats of the eye at the posterior pole, near the point of division, and those which are found at the periphery, near the vascular anastomoses of the long ciliary arteries with the short ciliary arteries. Poncet's method of operating is as follows: 1. Division of the conjunctiva between the superior and external rectus, and, if the interpalpebral aperture is narrow, division of the external commissure; division of the fibrous capsule of the eyeball throughout the same extent as the conjunctival opening, dissecting up longitudinally along the muscles and thus avoiding the vessels. 2. Passing a thread through the tendon of the external rectus in order to move the eye inward or outward easily. 3. Separation of the capsule from the posterior hemisphere by careful to-and-fro movements of the probe-pointed scissors, carefully avoiding the insertions of the oblique muscles and all bruising of the sclera. As soon as the optic nerve is reached, isolate it by pushing the capsule and conjunctiva carefully backward. 4. Division of the nerve after repeated digital exploration, as far back as six millimetres behind the eye. Poncet's conclusions as to the effects of optico-ciliary neurotomy immediately behind the eye are as follows: 1. Disturbances of circulation, rapidly disappearing, owing to anterior anastomoses, but inducing a circumvascular migration of white blood globules into the limitans interna of the retina. 2. Inflammation of the divided vessels, propagated to the retina, choroid, and optic nerve; papillitis, periarteritis, endarteritis; slight fibrous organization of leucocytes in the vitreous, on the papilla, and along the vessels—this occurring from the eighth to the thirtieth day. 3. Absolute sclerosis of the vessels, with pigmentary infiltration and passage of pigmentary masses into the vitreous—this within eighteen months. These phenomena sometimes end in phthisis of the eyeball. Besides these chronic disorders, there occur immediate inflammatory lesions around the posterior pole. They are shown by the rapid degeneration of the retina and choroid in this region, and are due to a division of the vessels too near the eye. They may be avoided by respecting the insertions of the muscles and by dividing the optic nerve six millimetres behind the eye.

FAUCHERON ON SUPRA-ORBITAL NEURALGIA.—Faucheron ("Rec. d'Opht.," Mar., 1881) reasons, from his statistical researches of one hundred cases, that this affection occurs more frequently upon the left side than upon the right; that it is more frequent in women than in men; that it is more frequent in middle life than at either of the extremes of life; and that it is almost always unilateral. In regard to its relations with the eye, Faucheron's conclusions are as follows: 1st, There is an actual pathological connection between the supra-orbital nerve and the organ of vision; 2d, this pathological connection is demonstrated clinically and experimentally; 3d, the functional troubles usually caused in the eye by frontal neuralgia are: conjunctival injection, lachrymation, photophobia, spasm of the upper lid, asthenopia or amblyopia; 4th, this neuralgia may in certain cases cause mydriasis, or myosis, or a real amaurosis. 5th, these different complications, apparently alarming, are never grave, and always disappear with the cessation of the neuralgia.

PÉAN ON FISTULA OF THE FRONTAL SINUS.—Péan's case ("Gaz. des Hôp.," Jan. 22, 1881) was in a man, æt. 24. The fistulous orifice, from which exuded a thin pus, was in the left eyebrow, and had resulted from a contused wound received some time before, but exactly how long is not stated. The patient suffered from constant frontal pain, vertigo, and neuralgic attacks in the course of the supra-orbital nerve and its branches. Péan made a crucial incision at the fistulous orifice and denuded the bone for a space of four square centimetres. He then opened through the anterior wall of the frontal sinus by the aid of the polytribe, making three or four small apertures, and then breaking down the intervening bony tissue. The cavity having been thus completely exposed, the mucous membrane lining it was freed of the fungous granulations. A small style was then passed through the infundibulum, so as to serve as a drain, and the wound was dressed with phenic-acid dressing. Three weeks later the patient was discharged entirely cured.

PANAS ON EXOPHTHALMIC GOÎTRE.—Panas ("Arch. d'Ophth.," Jan.–Feb., 1881) thinks that the various symptoms point to a lack of action of the cervico-cephalic vaso-constrictor nerves. The alterations of nutrition, which need time for their production, are secondary, and may even be wanting when the disease has lasted for a long time. Vascular distention is, however, a constant factor. In Basedow's disease there is never any myosis, while in paralysis of the great sympathetic in the neck it is a constant symptom. An important question to solve is whether the exophthalmus is primitive and due to a bulbar lesion, or whether it is not rather due to the obstruction in the circulation and to the dyspnœa produced by the goître. Panas concludes that it is primitive. The constant participation of the heart in the troubles which characterize the affection leads Panas to place the seat of the nerve lesion in the medulla. He agrees with Vulpian in thinking that the rapidity of the heart's action is due to irritation of the sympathetic cardiac filaments. He regards the goître and the exophthalmus as due to the enormous distention of the vessels of the head and subsequently to the parenchymatous hypertrophy which results from it. As to the treatment of the affection he advances nothing new.

Bradford on the Electro-Magnet in Ophthalmic Practice.—Bradford ("Boston Med. and Surg. Jour.," Mar. 31, 1881) presents the advantages of this instrument over the permanent magnet for the purpose of removing foreign particles of iron or steel from the eye. In modeling such an instrument for use, we must combine the minimum of size with the maximum of power, and also the smallest and most compact battery that proves available. The instrument he recommends consists of a core of soft Norway iron, one third of an inch in diameter and two and a half inches in length; to one end of this solid cylinder is riveted a flat circular disk of the same material, one inch in diameter and one sixteenth of an inch thick. The surrounding helix is composed of insulated copper wires, weighing twenty-nine grains to the foot, making eight convolutions of one and three quarter inches in length. The polar extensions are respectively five, four, and three thirty-seconds of an inch in diameter, and one half inch in length; their suspensive power equals twenty, sixteen, and eleven, each, when an armature of soft iron, one inch by one tenth in diameter, is used, which is within two ounces of the saturation point. The battery used is a single bichromate-of-potassium cell, having eight square inches of negative surface. The magnet weighs about five ounces, and by the addition of another cell the intensity of its field is made as great as that of a magnet capable of lifting a ton. The size of a magnet should be in proportion to the size of the body acted upon. The amount of the suspensive power of any magnet when saturated, as every magnet used in ophthalmic surgery should be, depends upon the size of the foreign body. Hence, the larger the fragment the more probable its removal; and, conversely, the smaller the fragment the more difficult its extraction. Finally, a point may be reached where the resistance to be overcome exceeds the amount of polarity capable of being induced. One important point in regard to all incisions made for the entrance of the magnet, and the removal of a foreign body from the eye, is that the cut should be not one with parallel edges, but T-shaped; as in the former case, when the extraction of the foreign body takes place, it is invariably stripped off the end of the magnet, and is retained at the site of the wound, or drops into the interior of the eye.

Hirschberg on Malignant Tumors of the Eye.—Hirschberg ("Arch. of Ophth.," x, 1) discusses retinal glioma and sarcoma uveæ. According to him, the usual form of retinal glioma begins in the inner granular layer and grows outward toward the choroid (glioma retinæ exophytum). In rare cases it begins in the inner layers of the retina and grows inward (glioma retinæ endophytum). He does not mean to distinguish the latter as a small-cell circumvascular sarcoma from the former. In the beginning the disease is strictly a local one, but soon becomes general, and is only to be cured in its earliest stages by radical extirpation, but by this process it can be cut short with certainty. Coming to the uveal tract, sarcomata of the choroid have the peculiarity that, when they develop slowly, they are generally complicated by metastatic tumors of the liver. In the second or glaucomatous stage of choroidal sarcoma, these tumors are, in contradistinction to glioma retinæ, still curable by enucleation, though not in the majority of cases. The greatest enlargements of the liver by melanotic tumors are caused by primary sarcomata of the choroid. In such cases even enucleation does not always protect the patient from metastasis, while, if retinal glioma is enucleated in its primary stage, the cure is certain. No case of choroidal sarcoma can be considered cured unless at least two years have passed since the enucleation of the eye. Hirschberg has never seen a local relapse of a choroidal sarcoma when the eye has been enucleated while the tumor was still confined within the eyeball.

PSYCHOLOGICAL NOTES.*

Stearns on the Care of the Chronic Insane.—Dr. Stearns ("Arch. of Med.," Feb., 1881) considers methods of providing for the "harmless chronic insane," but some of those whose characteristics are mentioned could properly be called only *comparatively* harmless, or harmless at times. [In fact, it may be doubted whether any really insane person is perfectly "harmless"—that is, *not liable* to be a source of danger to himself or others. Certain it is that many most deplorable tragedies have resulted from inferring harmlessness from habitual quiet or pleasant demeanor in the chronic insane. It is conceded that it is impossible for the same mind to conceive or, often, even to trace the path connecting delusive conception and action. An apparently innocent or amusing delusion may lead to a criminal act of frightful character. Most of those who enter a hospital in consequence of homicidal acts are docile or even agreeable patients. In the progress of dementia it is not unusual for delusions to arise entirely unsuspected by those observing the patient, and only betraying themselves in some extraordinary act, when the opportunity occurs. Dr. Stearns does not ignore this fact, but he does not give it the prominence which it deserves, for it has a very practical value in the problem which he discusses. True philanthropy does not consist in merely securing to the insane comforts, treatment, and a measure of liberty, but in doing this and also thoroughly securing the community from risks. In spite of the irresponsible clamor which originates in false sentiment and imperfect recovery from mental disease, and results in injudicious legislation and the harassing of asylum administrators, the fact is that true progress would be extension of hospital or other restraint to a greater proportion of the insane, and an increase in the facility of securing it promptly. Already, in Massachusetts, the insane themselves have experienced detriment from recent legislation procured by would-be philanthropists, and the detriment would have been far greater but for open, habitual disregard of the law by those having insane commitments in charge.] Dr. Stearns suggests three modes of caring for those described as harmless. First, they may be retained in asylums for the insane, where many of them now are; secondly, they may be placed in homes or asylums specially constructed for and adapted to the use and care of such a class of persons; thirdly, they may be placed in the private homes of farmers and others, who may be, or not, their relatives, in their own towns or elsewhere. [The principal objection to their being permanently retained in asylums is the expense. It is not probable that the community, already overtaxed to support a gigantic system of over-education, claimed by some to be itself a cause of increase of insanity and pauperism, will ever supply hospitals sufficient to properly accommodate all the insane; and hence the presence of the chronic cases would crowd and even exclude many more acute and curable cases. And, while it is hardly practicable to discriminate, and vary the expenditure much for different classes while under the same roof, it is a fact that a considerably larger outlay is required for the best management of acute and curable cases than for the incurable. Dr. Stearns also claims that, in association with acute cases, the chronic ones are liable to be neglected, and the patients' capacities suffered to degenerate. This is so evidently due to direct fault in administration, which might exist *wherever* the patients were cared for, that it would lose its force as an argument were it not that, practically, a considerable number of recoveries have been unexpectedly observed among persons long insane, and removed, for economical reasons, to comparatively inexpensive quarters. It is not probable, however, that this was due to increased attention or any special effort at development of their powers of mind. It is a fact that a radical change of surroundings is a good thing to try in chronic cases of insanity, and will result in a certain percentage of recoveries. In connection with the plan of private homes with farmers and others, Dr. Stearns alludes to the insane communities at Gheel and in Scotland, and judges that they can hardly be regarded even in those countries as entirely successful, as there is no movement toward extending them. As the essential part of the Gheel system is a regular lunatic asylum where those requiring treatment are kept, there does not seem to be much theoretical difference between the plan there and elsewhere. There is a semblance of inspection, to be sure, but, as we are informed that methods of discipline and mechanical restraint are administered there by the villagers which would not be tolerated in America at the present day, either in or out of an asylum, it may be doubted whether the average lunatic is as happy there as in this country, in spite of the ecstatic encomiums on the system which have been published by certain chronic reformers. The number of insane persons in our community who reside with friends or relatives must be very large—no returns that ever have been published can have given the whole number, for the subject is one on which people are sensitive, and about which they are unwilling to give information. Dr. Stearns remarks that no obstacle, public or private, has ever existed to making such disposition of insane patients, except such as may be inherent in the nature of the case. As a fact, insane people here do not go to an asylum until it is found they can not be properly taken care of elsewhere. Every one can recall persons of impaired mind within his own circle of acquaintance. Our asylums are continually discharging persons who are not "cured" but "relieved," and they remain at large, or in home custody, till they need treatment or restraint again. It is difficult to see how these persons would profit by being aggregated into one village instead of going to their native places. As before said, the number at large needs to be diminished for public safety, rather than increased. The people of Westchester County, N. Y., can not have yet forgotten the so-called Sleepy Hollow murder, in which an unfortunate maniac, without a shadow of motive apart from disease, slew his wife and one intimate friend and severely wounded another, and was hung, while still insane, without ever having been convicted by an entire jury. He had been insane for years, and had appeared harmless, and probably was so till very near the time of the homicide. There is no room to doubt that there are other so-called harmless insane persons now at large who will sooner or later perpetrate similar acts. A thorough and efficient system of inspection of all deficient persons, whether in legal custody or not, would do much to diminish the danger. Dr. Stearns finds in the absence of such oversight the chief objection to providing for chronic cases in private families, but does not demonstrate that such a system would not be practicable, and on the whole economical. It would certainly be less expensive than care in some of our palatial asylums, where the cost of maintenance and due proportion of interest on capital invested amount to more than would board and lodging in a city hotel. There are, of course, a few persons in our community of large means, who are provided for separately in the families of physicians or other responsible parties. This amounts, in fact, to organizing a separate asylum for each case, and such may be left out of consideration. But most of the class Dr. Stearns is planning for have little or no means, and the duty of maintenance falls on the public. It is true, as Dr. Stearns claims, that, with any such system of inspection as is available under present laws, it would be difficult to prevent abuse and injustice, if they were boarded out. His reports of the treatment he has known patients to receive at the hands of relatives when requiring moderate restraint are not encouraging. Certainly strangers could do no worse, even without inspection. Dr. Stearns is, however, decidedly in favor of homes or asylums specially constructed for and adapted to the care and use of the chronic insane. Their advantages are: thorough *inspection*, the consideration of peculiarities, and treatment of illness, promptly, by competent officers; a greater degree of liberty than is allowable in an asylum for acute cases, while yet the patients would be protected from their own vagaries, and not allowed to wander about as they would do if at large, to their own discomfort and detriment. Work would be provided for them, and they would have many of the opportunities for diversion that exist in other asylums. The home could, indeed, be placed so near to a large asylum that some of the advantages would be common to both, and, a farm being provided, the home would aid in providing for the asylum. On these grounds—namely, greater happiness, more personal liberty, productive industry, discriminating care, and a minimum of expenditure—Dr. Stearns may be said to have fairly made out his case in favor of separate receptacles for chronic cases.]

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* Laid over from Dr. Folsom's Report in the July number.—*Editor.*

Channing on Insane Criminals.—Dr. Channing ("Boston Med. and Surg. Jour.," Feb. 24, 1881) makes a plea for the control of convicted criminals who become insane, and for the insane who commit criminal acts, together, in separate receptacles. There are some of the latter class who can appropriately go to the ordinary lunatic hospitals, but it is found that a large proportion of those found not guilty by reason of insanity really belong to the criminal class. Dr. Channing's experience has been drawn principally from the asylum at Auburn, N. Y. The advantages of separation of criminals are found to extend not only to the innocent insane, but to the criminals also.

Hughes on Experts in Insanity.—Dr. Hughes ("Alienist and Neurol.," Jan., 1881) objects to the use of "the hypothetical case" as a means of ascertaining the opinions of experts in insanity, and thinks it tends to mislead the court and the jury and prevents the expert from doing justice to the case and to himself. He indorses Dr. Ray's suggestion of a special commission "consisting of men who possess a well-earned reputation in the knowledge and management of mental derangement." [It is to be hoped that this may be the adopted method at some future time, but, as *conviction* and *acquittal* are respectively the ends striven for by the counsel for prosecution and defense, rather than development of the actual truth, it may be a long time first.]

Lasègue on the Melancholia of Indecision.—M. Lasègue ("Arch. Gén. de Méd.," Nov., 1880) describes a form of melancholia which he calls the melancholia of indecision. The patient being in good health finds himself constrained to determine some course of action; before deciding he falls into perplexity, makes contradictory partial decisions, and deliberates without result, and from this beginning, invariably, the malady described takes origin, and it is also characteristic that this state of mind is concealed from others for a considerable time. When this period of incubation is over, having lasted months rather than weeks, the patient loses the power of reticence, and in fact obtrudes his doubts and restless mental efforts on those about him. The result is incapacity for business, great depression, insomnia, disturbance of bodily functions; in fact, melancholia. The prognosis is generally favorable. [M. Lasègue does not make it evident that melancholia beginning in this way differs essentially from other forms of acute melancholia; nor does it seem probable that the initial perplexity is a sufficient moral cause for the disease. It is, rather, an early symptom.]

Hammond on Abscess of the Liver and Melancholia. — Dr. Hammond ("Neurol. Contrib.," i, 3, 1881) states that he has performed aspiration of the liver for abscess in melancholia, etc., in forty-three cases; in twenty-seven cases there was no pus nor any other fluid removed; in one there was a hydatid cyst; and in fifteen pus was obtained, with relief. He asserts that in no case had adhesions formed between the surface of the liver and the abdominal wall, and that in no case was the operation followed by the slightest untoward result. He concludes from his experience that hepatic abscesses often exist, and may do so without local symptoms or general disturbance; that, if associated with hypochondria, etc., evacuation of pus will result in cure of the disorder and saving of life, while, if there is no pus, no harm is done. He therefore recommends that *in all cases of hypochondria or melancholia* the region of the liver should be carefully explored, and that, even if no fluctuation or any other sign of abscess be discovered, aspiration through one of the intercostal spaces should be performed.

Items.—We have received the first number of the "Mississippi Valley Medical Monthly," published in Memphis, Tennessee, and edited by Dr. J. J. Jones and Dr. Julius Wise, who announce that, "while a full share of attention will be given to all medical topics of general interest, the 'Monthly' will be more especially devoted to the discussion and consideration of the endemic and epidemic diseases of the Mississippi Valley." ═══ The "Annali di Chimica" enters upon its seventy-second volume with an amplification of its scope and title, being called the "Annali di Chimica Applicata alla Medicina." It is edited by Signor C. Pavesi, a chemist, and Dr. Plinio Schivardi, and is published in Milan.

Artificial Vaccine Lymph.—Mr. J. Lawrence-Hamilton, 34 Gloucester Terrace, W., London, proposes, says "The Lancet," to introduce an abundant supply of pure artificial lymph, produced outside the body of living man or living animal, by isolating and then breeding the vaccine organisms in suitable germ-nutritive solutions which have been previously deprived of all septic and other noxious germs. The publication of the special precautions and physical conditions which Mr. Lawrence-Hamilton considers necessary to secure safety and success in breeding, and then in employing, the artificial vaccine lymph, as well as the results of inoculating men, cattle, and other animals there-with, will be postponed till a subsequent date.

Army Intelligence.—*Official List of Changes of Stations and Duties of Officers of the Medical Department, United States Army, from June 14, 1881, to July 13, 1881.*—Middleton, J. V. D., Major and Surgeon. Having reported in person, is assigned to duty at Fort Hays, Kansas, relieving Assistant Surgeon Munn. S. O. 122, Department of the Missouri, June 21, 1881. ===== Gardner, W. H., Captain and Assistant Surgeon. Granted leave of absence for four months on surgeon's certificate of disability. S. O. 138, A. G. O., June 18, 1881. ===== Koerper, E. A., Captain and Assistant Surgeon. Granted leave of absence for two months and fifteen days. S. O. 143, A. G. O., June 24, 1881. ===== Munn, C. E., Captain and Assistant Surgeon. When relieved by Surgeon Middleton to proceed to Fort Bayard, New Mexico, and report to the commanding officer for duty. S. O. 122, C. S., Department of the Missouri. ===== DeWitt, C., Captain and Assistant Surgeon. Granted leave of absence for four months. S. O. 137, A. G. O., June 17, 1881. ===== Torney, G. H., Captain and Assistant Surgeon. Granted leave of absence for one month, with permission to apply for an extension of one month, to take effect when relieved by Assistant Surgeon A. W. Taylor. S. O. 122, Department of the Missouri, June 21, 1881. ===== Shannon, Wm. C., Captain and Assistant Surgeon. Assigned to duty with escort to Ute Commission from Fort Bridger to the Uintah Agency. On return of commission to Bridger, to rejoin his station at Fort D. A. Russell. S. O. 62, Department of the Platte, July 6, 1881. ===== Taylor, A. W., First Lieutenant and Assistant Surgeon. To proceed from Fort Supply, Indian Territory, to Fort Lyon, Colorado, and report to the commanding officer for temporary duty. S. O. 122, C. S., Department of the Missouri.

Marine-Hospital Service.—*Official List of Changes of Stations and Duties of Medical Officers of the United States Marine-Hospital Service, from April 1, 1881, to June 30, 1881.*—Bailhache, P. H., Surgeon. Detailed as chairman, Board of Examiners, April 5, 1881. ===== Wyman, Walter, Surgeon. Detailed for temporary duty as medical officer, Revenue Bark Chase, May 31, 1881. ===== Long, W. H., Surgeon. Detailed as member, Board of Examiners, April 5, 1881. ===== Murray, R. D., Surgeon. To proceed to Memphis, Tennessee, assume charge of the service at that port, and inspect the service at Vicksburg, Mississippi, April 8, 1881. ===== Purviance, George, Surgeon. Detailed as recorder, Board of Examiners, April 5, 1881. To proceed to Richmond, Virginia, as inspector, April 30, 1881. Detailed as chairman, Board of Survey, to examine applicants for admission to the Revenue Marine Service, May 10, 1881. ===== Doering, E. J., Surgeon. Granted leave of absence for thirty days, from April 21, 1881, April 2, 1881. ===== Austin, H. W., Surgeon. Granted leave of absence for thirty days, from May 5, 1881, April 2, 1881. ===== Gassaway, J. M., Passed Assistant Surgeon. To proceed to Philadelphia, Pennsylvania, and assume charge of the service, relieving Passed Assistant Surgeon Stoner, April 7, 1881. ===== Smith, Henry, Passed Assistant Surgeon. To report to chairman, Board of Examiners, April 25, 1881. ===== Stoner, G. W., Passed Assistant Surgeon. To proceed to Portland, Maine, and assume charge of the service, relieving Surgeon Doering, April 7, 1881. ===== Fisher, J. C., Passed Assistant Surgeon. Detailed as recorder, Board of Survey, to examine applicants for admission to the Revenue Marine Service, May 10, 1881. ===== Wheeler, W. A., Assistant Surgeon. Granted leave of absence for thirty days (he providing a substitute), from July 7, 1881, June 23, 1881. ===== Carmichael, D. A., Assistant Surgeon. To proceed to New York, and report to Surgeon Fessenden for duty, April 7, 1881. *Resignation.*—Doering, E. J., Surgeon. Resignation accepted by the Secretary of the Treasury, to take effect May 20, 1881, April 2, 1881. *Promotion.*—Gassaway, J. M., Surgeon. Promoted to be Surgeon from May 21, 1881, May 16, 1881.

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THE PROPER LIMITATIONS OF EMMET'S OPERATION FOR LACERATIONS OF THE CERVIX UTERI.*

By CHARLES CARROLL LEE, M. D.,
SURGEON TO THE NEW YORK STATE WOMAN'S HOSPITAL, ETC.

Gentlemen of the County Medical Society: When I was lately honored by our President with a request to read a paper before you, I decided, with some misgiving, to ask your reconsideration of a subject which, to some of my audience, I fear will seem threadbare.

It is now eleven years since a distinguished gynæcologist of this city drew your attention to the topic I shall discuss this evening, and, in a paper on "The Surgery of the Cervix,"† adverted to the importance of lacerations of that structure as a cause of uterine disease. Little heed was paid to his suggestion at that time; and, four years later,‡ he again urged upon your society the importance of this lesion—so ably enforcing his views, and so fully illustrating his subject on this occasion, that his demonstration was hailed with enthusiasm by his fellow-workers in the profession.

Unhappily—although, perhaps, most naturally—the tendency of hasty minds is to push every improvement in science to unwarrantable extremes; it should, therefore, cause no surprise that Dr. Emmet's operation was soon performed in the most trifling cases, and advised in conditions entirely unsuitable to it. Hence an unjust obloquy has been thrown upon the operation of "trachelorrhaphy," and in many European countries it is regarded with disfavor; this is especially true of England, where, only a year ago, a noted London gynæcologist remarked to me that "American surgeons seemed to pass their time between dividing the cervix when nature had left it intact, and sedulously stitching up the fissures which parturition left on its surface."

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* Read before the Medical Society of the County of New York, May 23, 1881.

† "Am. Jour. of Obstet.," Feb., 1869.

‡ *Ibid.*, Nov., 1874.

To assist the busy practitioner in selecting the cases of this kind that really need operative interference, and to aid, if possible, in establishing more clearly the limits within which the operation should rest, will be the object of this short paper.

First, as to the history of the procedure: so much has of late years been written on the subject that only a word seems necessary. From the days of Hippocrates observers have noted more or less decided rents or fissures of the cervix uteri in women who have borne children. Nor have these seemed to follow severe labors only; the numerous causes which may produce the lesion may be seen at a glance in the admirable chapter on this subject in Professor Thomas's work on the "Diseases of Women," where he attributes its causation to "cicatricial material in the tissue of the cervix, cancerous degeneration of cervix, section of the cervix during labor, too early evacuation of liquor amnii, and abortion," as well as to the more frequent conditions of "precipitate labor, manual delivery, and instrumental delivery."

In 1839 Duparcque [*] described it minutely in France; in 1851 Sir James Simpson [†] discussed it before the Edinburgh Obstetrical Society. In 1856 the late Dr. A. K. Gardner,[‡] of this city, alluded to it as a frequent cause of uterine disease and of sterility. In Germany, Professors Roser,[#] of Marburg, and Breisky,[‖] of Prague, have contributed largely to its elucidation.

But it was reserved for this city and for this society to hear the first full and conclusive explanation [^] of its importance as a factor in the causation of uterine disease, together with an absolutely perfect method of its cure. In addition to the remarkable paper last referred to, more or less elaborate *résumés* of the subject have appeared in this country from Drs. Wing[*] and Baker,[†] of Boston, Chase,[‡] Dudley,[#] and Mundé,[‖] and, as long ago as in 1868, from Professor Montrose A. Pallen,[△] then residing in St. Louis. In Paris an excellent essay on the subject was published two years ago by my friend Dr. C. M. Desvernine,[◊] now of Havana. Among these the most conspicuous and important publications have been those of Dr. Mundé, who enhanced the value of a capital paper by an admirable series of colored plates, illustrating the different types of lacerated cervix met with in practice; and of Dr. Pallen, who even antedated Dr. Emmet in the publication of his views, although justly and fully according to the latter all claims as to priority in the operation.

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[*] "Maladies de la Matrice," t. ii.—Ruptures et Déchirures de l'Utérus.

[†] "Trans. of the Edinburgh Obstet. Soc.," Jan. 22, 1851.

[‡] "Causes and Treatment of Sterility," New York, 1856.

[#] "Arch. f. Heilk.," ii, 2, p. 298.

[‖] "Wien. med. Woch.," 1876.

[^] Emmet: "Lacerations of the Cervix Uteri," 1874.

Nor is Dr. Pallen entitled to credit only for his early recognition of the value of "trachelorrhaphy" as employed in gynæcological practice proper; he has also the distinction of being, so far as I know, the only writer who has advocated the application of this measure in the parturient state, in cases of severe laceration of the cervix with profuse hæmorrhage. In an essay on the "Accidents of Parturition requiring Surgical Treatment," published in the "Richmond and Louisville Medical and Surgical Journal" for 1874, he describes fully, intelligently, and forcibly the danger of hæmorrhage and shock from extensive laceration of the cervix; and for this accident he advises immediate closure of the wound by sutures in preference to the styptic tampon, and gives illustrative cases.

It is doubtful whether all cases of so-called post-partum hæmorrhage with firmly-contracted uterus, which often prove a puzzle to obstetricians, be not of this nature; for it is certain that, both in unusually prolonged as well as in unusually rapid and violent labors, cervical damage occurs oftener than is suspected at the bedside.

I well remember a typical case of this in the practice of Dr. George T. Elliot, in which we delivered a Cuban lady with forceps in an exceedingly severe labor. The womb had lost none of its tonicity, and, when the placenta was expressed, it remained at the pelvic brim, firm and hard as a ball; nevertheless, the patient bled profusely, and her condition soon became alarming. All the usual efforts were made without avail to check the flow, when it suddenly occurred to me that the cervix might be torn; in an instant we turned her on her side, and with a Sims's speculum we found a lateral rent extending deeply through the cervix and an inch into the vaginal wall. From this the blood welled up so rapidly that we feared the circular artery of the cervix was torn; compresses of cotton pads, carbolized and rolled in alum, were quickly stuffed into the wound and the vagina tamponed. The hæmorrhage at once ceased; the patient made a good recovery, but she recovered with a lacerated cervix, which would have been averted had we sewed up the wound at once.

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[*] "Boston Med. and Surg. Jour.," Mar., 1876.

[†] *Ibid.*, Sept., 1877.

[‡] "Trans. of the Med. Soc. of the State of New York," 1878.

[#] "N. Y. Med. Jour.," Jan., 1878.

[‖] "Am. Jour. of Obstet.," Jan., 1879.

[△] "St. Louis Med. and Surg. Jour.," May, 1868.

[◊] Thèse de Paris, 1879.

But, to return to our subject, was this novel proposition of Dr. Emmet an important contribution to surgery? Those among us best qualified to judge will answer the question.

In the discussion which followed the reading of Dr. Emmet's paper before this society in September, 1874, Dr. J. Marion Sims said: "I have performed this operation often enough to speak in positive terms of its value. The discussion must of necessity be one-sided. There can be no objection, no opposition to the operation. We must accept it as Dr. Emmet has given it to us, for it is perfect—perfect in its methods and perfect in its results. Like all new operations, it is likely to be abused; but the time will soon arrive when it will assume its place in the foremost rank of useful improvements."

The late Dr. Peaslee bore similar testimony to the completeness of Dr. Emmet's proposition.

At a meeting of the New York State Medical Society, in June, 1878, Professor Fordyce Barker, in discussing a paper on this subject by Dr. Walter B. Chase, said: "I think there can be no doubt that the paper first read by Dr. Emmet, of New York, upon lacerations of the cervix associated with the puerperal state, is one of the most important contributions which have been made to gynæcology." He then considers, with great intelligence and fairness, the question whether subinvolution prevents cicatrization of a puerperal laceration of the cervix, or whether the laceration is the primary condition and the agency which prevents proper involution of the uterus. Rejecting both these theories, he concludes that the underlying cause of both is more deeply seated, and is either incompetent obstetric attendance or careless supervision of the puerperal state. From this conclusion few will dissent to-day.

In the last edition of his classical work, Dr. Thomas terms it a contribution which, "even if its eminent author had done nothing else to lay his profession under obligation, would indelibly write his name upon the records of gynæcology. No one contribution to this department which has been made in the last half century has exerted a more marked influence upon uterine pathology than this is now doing, and will do in the future. None will have more influence in abolishing useless and hurtful therapeutical measures." "It is surely not too much to say of it," he adds elsewhere, "that it constitutes one of the most important contributions to gynæcology which have ever been made."

This is certainly high praise, and, if it be justly bestowed, it behooves us to look carefully into the indications for the performance of such an operation, and to select with intelligence the cases in which benefit to the patient may reasonably be expected to follow it.

Nothing could be clearer or more minute than the description Dr. Emmet has given of the appearance of this lesion, of the method of recognizing it, and of the steps of the operation which he devised for its relief. But, curiously enough, neither in his several papers before this society, nor in his "System of Gynæcology," has he placed clearly upon record the conditions which contraindicate the performance of trachelorrhaphy, nor the degrees of laceration which render the operation useless. Still, such conditions do environ many of the cases of lacerated cervix that are presented to us in practice, and it is most important to recognize this in advance.

I.—For instance, is the existence of *periuterine cellulitis* an obstacle or barrier to the operation? Undoubtedly it is; and yet how often are we asked either to operate or to approve, in consultation, of an operation while the pelvis is still half filled with the deposit of lymph of an uncured cellulitis! The records of the Woman's Hospital in this city alone show this to be of very frequent occurrence; and in my intercourse with professional friends it has happened five or six times within the last year.

Now, to attempt a surgical procedure on the neck of the womb which, however carefully and dexterously done, involves considerable traction on the uterus, while that organ is fixed in the pelvis by perimetric deposit, would seem incredible if such instances were not known to occur. A year ago a patient who had recently undergone this experience was admitted into one of my wards in the Woman's Hospital, and I have certainly never seen a case of pelvic inflammation more intense or more extensive than hers was. The anterior and posterior culs-de-sac were so densely filled with lymph that the vagina was all but obliterated; the cervix presented at the vulva and was dense and highly inflamed, while the throbbing of the distended uterine vessels and the glairy mucus that oozed from the narrowed os bore testimony to the high grade of endometritis that existed. This case resisted every effort that was made to allay the pelvic inflammation, until a large retro-uterine abscess formed and opened, with temporary relief. Even after this it was several weeks before the patient could leave her bed, and to this day she remains an invalid from this cause.

In obtaining the history of this case from her former adviser, who gave it with great frankness, I found that he had doubted the propriety of operating on the cervix under such circumstances, but had thought it best, as he naïvely stated, "to give her the benefit of the doubt." I do not for one moment suppose that such instances as this could often occur; but, if the error has happened once, it may happen again, and members of the profession whose surgical aspirations are keener than their judgment, if such there be, should surely be warned against its repetition.

II.—Of the importance of *Pelvic Peritonitis*—either acute or chronic—as a contraindication of *trachelorrhaphy*, I shall have little to say: partly because clinical observers differ as to the possibility of separating this lesion from perimetric cellulitis, and partly because the objection raised in the former condition would naturally and equally lie in this case also. It may, however, be briefly stated that, as fixity of the womb from inflammatory deposits is peculiarly characteristic of pelvic peritonitis, its existence in any form should be deemed an insuperable barrier to the operation.

I must confess that I have never seen a case where trachelorrhaphy was performed during the course of a frank pelvic peritonitis; but, after my experience in cellulitis, I have felt that in this direction all things were possible.

In a word, so long as any decided inflammation—acute or chronic—exists around the womb, or, as Dr. Emmet himself has expressed it, "so long as there can be detected, by pressure from the finger, any tenderness in the neighboring connective tissue, it is not safe to operate." And to this caution I add that the operation is equally contraindicated by ascertained *endometritis*, or even by acute cervicitis, which is often found to coexist with severe lacerations of the cervix.

III.—When no pelvic inflammation exists, however, the operation may be (and is) contraindicated for the time being by various forms of general ill-health—by extreme anæmia, chlorosis, or general debility, by constitutional syphilis when accompanied by vaginal lesions; in a word, by all extreme conditions of impaired health, except such as may reasonably be presumed to depend upon the laceration itself, or the uterine disturbance which it fosters.

That there occur in practice many cases which present notable rents or tears in the cervix, and yet offer no indication for operative interference, is well known. No one has stated this more unreservedly than Dr. Emmet himself; while Dr. T. G. Thomas,* an ardent advocate for trachelorrhaphy, says: "If it become the rule of practice that all cervical lacerations should be closed without reference to their pathological influences, many women will be exposed to operation without cause and without compensation." This sentence gives the key-note to our selection or rejection of cases for operation. The obvious or ascertained pathological influence of the laceration—not its extent or size—should be our guide for its treatment. If it present a cicatrized surface, and if there be no hyperplasia or inflammatory condition of either cervix or uterine body, a surgical operation would be absurd, even though the rent were bilateral and had divided the cervix to its vaginal septum.

If, on the contrary, the laceration be unilateral only, and comparatively small in area, but with a raw, uncicatrized surface, and associated with either cervicitis or metritis, it is absolutely certain that the concomitant inflammation will never get well until the laceration is cured. True, if we put the patient to bed and keep her rigidly in the recumbent position for many weeks, we shall, with the aid of astringents, escharotics, the galvanic cautery, hot vaginal injections, and constant cleanliness, *seem* to cure both the uterine inflammation and the so-called "ulcer." But this is generally fallacious; no sooner does she begin to walk about than the thickened ectropic cervix is again exposed to friction against the posterior vaginal wall, the irritation begins anew, the "ulceration" and mucopurulent discharge return, and the same pathological changes ensue. Our patient disappears from view; we *think* we have cured her; she has simply passed into the care of another specialist.

If this be true of *slight* ectropic lacerations, it holds *a fortiori* of those extreme cases of bilateral laceration with extensive eversion of the cervical mucosa, either with or without cystic degeneration, which Dr. Emmet has so carefully described, and the study of which led him to recognize the true significance of this lesion and the means of curing it. Here discussion is superfluous as to the influence of the cervical injury; nor shall I say one word as to its treatment by other methods than Emmet's, for experience has taught me that other treatment is palliative only, never curative.

This I should say with becoming modesty, well knowing that older observers hold opposite views. But, although I respect their sincerity, neither reflection nor observation in hospital or private practice has convinced me that mineral acids, potassa fusa, the galvanic cautery, and other destructive agents, even when used assiduously for many months, are to be preferred to a simple operation which cures the sufferer in a few weeks—not to speak of the false pathology upon which the caustic treatment is based.

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* "Diseases of Women," 5th ed., p. 353.

A third class of cases, much more limited than the former, is that in which the laceration has cicatrized, leaving the cervix tough and nodular, and the angles of the rent filled with cicatricial tissue. In this are frequently caught and compressed nerve filaments, which causes excessive reflex irritation of the uterus and of the general nervous system. The test of such a case (besides the general ocular evidence of laceration) is the sudden pain, like a toothache, which pressure with the finger in the angle of the tear generally gives. Here, indeed, it is possible that the galvanic cautery, by softening and partially destroying the "cicatricial plug," may prove a valuable resource; but in six months it would accomplish no more than trachelorrhaphy would yield in two or three weeks; and even then it would be impossible to be sure that all the "cicatricial plug" was absorbed; while, if escharotics be used, it is certain to be left worse than before.

In these cases *trachelorrhaphy* is distinctly indicated, and, within my observation, has never failed to yield a most satisfactory result, often exceeding the most sanguine anticipations.

In conclusion, and as a terser *résumé* of the preceding remarks, I would again urge upon you all the vital importance of

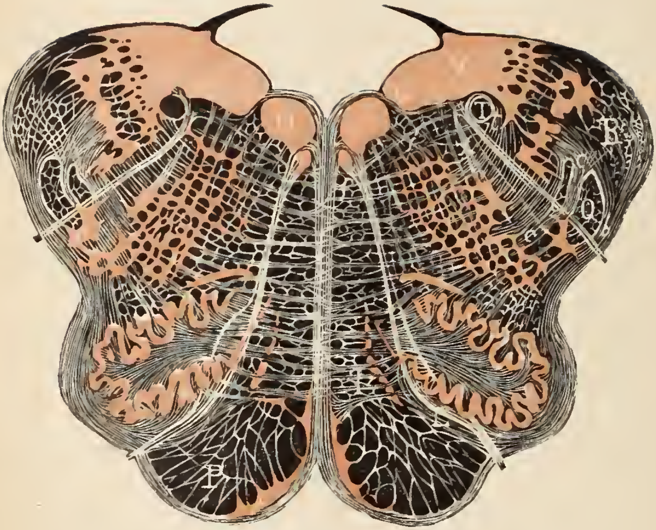
1. A more careful and systematic supervision of the lying-in state, and never to discharge an obstetrical patient from your care until the existence of a lacerated cervix or perinæum has been ascertained and, if possible, remedied.

2. When cases of lacerated cervix present themselves, never to counsel, or consent to, operative treatment until all traces of pelvic inflammation are subdued.

3. In the selection of cases for *trachelorrhaphy*, to be guided *solely by the pathological import of the laceration, and its probable influence upon the pelvic condition.*

4. In the treatment of cervical lacerations, when they really need treatment at all, to adhere resolutely to *trachelorrhaphy* until time—that final crucible in which all scientific improvements must be tested—shall yield us a surer and better method than that devised by the patient ingenuity of Thomas Addis Emmet.

79 Madison Avenue, New York, *May 20, 1881.*



Transverse Section of Oblongata at the Middle Olivary Plane.

The ganglionic substances are represented by a red color; the conducting strands divided in the section by black areas; those running in the plane of the section, by white lines.

NOTES ON THE ARCHITECTURE OF THE OBLONGATA.

By EDWARD C. SPITZKA, M. D.

It is now becoming generally recognized that any advance that is to be made beyond the present state of our knowledge concerning cerebral physiology and pathology calls for a preliminary and thorough study of the cerebral architecture. That day is past when it could be considered legitimate to refer every phenomenon provoked by an intra-cranial experiment to an altered activity of any single center! With the older experimenters, such a ganglion as that of the optic lobes, for example, would constitute a visual center, a coördinating center for the muscles of the eyeball, and a sweating center, for irritation of these lobes has been followed by results supporting all of these, among themselves, discordant ideas. To-day we know that, inasmuch as the optic lobes are not homogeneous, anatomically, but consist of distinct ganglionic accumulations, having various peripheral connections, some direct and others indirect in character, and include also important nerve strands derived from other ganglia, the optic lobes can not be dealt with as a physiological unit.

This reasoning applies with still greater force to the medulla oblongata. This segment of the brain contains more numerous tracts and centers than are to be found within any other correspondingly small segment of the encephalon. In the first place, it includes the nuclei and roots of certain cranial nerves; in the second, the tracts which pass cephalad from the spinal cord; in the third, certain ganglia situated on these tracts; in the fourth, an important ganglion of its own. It is only under very exceptional circumstances that an experimental or pathological lesion involves but one of these elements.

In the present paper I shall endeavor to render clear the relations of these elements as found in a transverse section of the oblongata, and shall in the course of the description discuss certain special points which have most recently been studied by Flechsig, Meynert, Laura, Krause, and myself. A section through the middle altitude of the olivary eminence exhibits most of the characteristic features of the oblongata, and in order to avoid complicating the subject I shall limit myself to those details found in a single plane. On a future occasion I hope to base a more extensive analysis of the great nerve tracts, and their topographical metamorphosis from those of the cord, on the present description.

1. *The Cranial Nerve Nuclei of the Middle Olivary Plane.*—It is customary to describe these nuclei as the continuation of the spinal cornua. This is only partially correct; a careful study of a series of transverse sections, including the upper part of the cord and the caudal* half of the oblongata, demonstrates that the homologue of the anterior gray cornu is cut off and diminishes as we pass cephalad, so that in the plane we are now studying it has actually disappeared.† It is the gelatinous gray matter ventrad of the central canal which, increasing in area, and including multipolar nerve cells, constitutes the hypoglossal nucleus. While the cells of this nucleus belong in their majority to the larger variety, and are arranged in characteristic groups fielded off by the entering fiber loops of the nerve roots and raphé, as Meynert has accurately described it, I fail to find any reference in the recent compilation of Schwalbe‡ to two special cell groups included in this nucleus which differ in important respects from their fellows. The first of these constitutes a separate cell mass visible in carminized specimens to the naked eye, and situated among those fibers of the hypoglossal nerve root which come directly from the raphé [*h*]. Its cells in the plane under consideration are generally small, and, unlike the angular multipolar cells of the main nucleus, are of an inflated shape, and apparently bi-polar, resembling, in fact, rather the small cells of the vagus origin. It is possibly this group to which Schwalbe refers when he speaks of an inner cell mass, situated between the hypoglossal nerve root, the raphé, and a horizontal strand issuing from the latter. If so, he has failed to note the aberrant character of the cells. The other group to which I desire to call attention is included in the main nucleus [*H*], being situated in its ventro-lateral edge; its cells correspond in shape and size to the ordinary type. Their peculiarity consists in the aberrant course of the axis-cylinder processes. These, of large size, and of a distinctness only excep-

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* I adopt in this paper the nomenclature suggested in part by Henle and Forel, and recently fully expounded by Wilder ("Science," March 26, 1881), according to which all parts situated nearer the head-end of the ideal animal axis are said to lie "cephalad," those nearer the posterior extremity, "caudad," of a certain point adopted as the gauge of comparison. In like manner the ambiguous "above" and "below" are replaced by "ventrad" and "dorsad," "external" and "internal" by "laterad" and "mesad." The advantage of using these terms becomes apparent especially in cerebral anatomy; whole volumes on this subject are obscure, merely on account of the observer's using "before" and "below" (for example) interchangeably; no matter how the brain is supposed to be situated in space, the same point which is ventral in one position will remain ventral in all.

† This is the real nucleus pyramidalis of Henle, who seems to have confounded with it the internal accessory olive. Strictly, Henle's designation is a misnomer.

‡ "Lehrbuch der Neurologie," von Dr. G. Schwalbe, 1880, p. 657.

tionally found in the nerve centers, do not run toward the hypoglossal nerve root, but altogether away from it, toward the reticular field [*i*]. I have traced a single process from this group as far as the nucleus which I have described in a former publication * as that of the laryngeal motor nerves, and therefore consider it rather an origin of the eleventh than of the twelfth pair, though it is not impossible that we have here an associating mechanism for the movements of the tongue and larynx.

The large molecular mass situated laterad of the hypoglossal nucleus is not of as simple a structure as some authors evidently believe. The barren portion dorsad of the letter V in the diagram belongs to the subendymal auditory nucleus. Ventrad and mesad of this portion we find two distinct cell groups. The lateral [V] consists of sparsely scattered, small elements; the mesal, of larger, distinct cells, not unlike certain cells of the auditory origin in shape, but pigmented in the adult; they are closely crowded [at G]. From the fact that the former group is best developed in the plane of the pneumogastric exit, and the latter in that of the glosso-pharyngeal exit, I am inclined to consider the former a species of nucleus for visceral innervations, the latter as a station for gustatory impressions. It is in favor of this view that what I designate as the visceral nucleus varies but slightly in the animal scale, while the gustatory nucleus is best developed in man and the apes.

The reticular gray of the tegmental field of the oblongata contains two accumulations of cells, which have important relations to the ninth, tenth, and eleventh pairs of cranial nerves. One of these has long been known to have such relations, and Clarke, Meynert, and others considered it the cephalic prolongation of that lateral cornu of the cervical cord from which the cervical division of the eleventh pair takes its origin. But Krause † considers its connection with efferent nerve roots so doubtful that he terms it the *nucleus ambiguus;* the latter adjective might be affixed to other cerebral centers with greater propriety. Laura ‡ concludes from his examinations that this nucleus really belongs to the hypoglossal nerve, and adduces the following reasons for this position: First, fibers can be seen passing from the nucleus across the median line to the neighborhood of the hypoglossal nerve root and nucleus of the opposite side. Secondly, the extent of the nucleus in the cephalo-caudad direction corresponds to that of the exit level of the twelfth pair. As to the first reason here given, the observation on which it is founded does not militate against Meynert's view, for fibers connected with a given nucleus are not necessarily efferent; they may be afferent in an anatomical sense—that is, derived from some higher center, which controls the nuclear center in its function. The fasciculus referred to by Laura was well known to Meynert,* and he has given it the interpretation of an additional root of the tenth pair. The question of the topographical extent of the *nucleus ambiguus* has been also studied by myself, but with the result of leading to different conclusions from those of the Italian investigator; it is true that the extent of the nucleus ambiguus is very nearly the same as that of the hypoglossal origin, but it corresponds still more accurately to the conjoined extent of the oblongata portion of the eleventh, and the entire tenth pairs. In addition, fibers can be clearly traced to the rootlets of only these two nerves, so that, as the cells are of the same shape generally found in motor nuclei, and contrast markedly with those cells from which the glosso-pharyngeal and *most* of the vagus fibers are derived, I am inclined to consider the nucleus ambiguus as the lowest center of the laryngeal motor periphery. The connection noticed by Laura with fibers crossing the raphé is much clearer in altitudes more cephalad than the ones where the hypoglossal nucleus is best developed.

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* "The Central Tubular Gray," "Jour. of Nerv. and Ment. Dis.," 1880.

† Krause, "Allgemeine und mikroskopische Anatomie."

‡ Laura, "Memorie della Reale Academia delle Scienze de Torino," 1878, 1879.

On the mesal side of the great ascending root of the trigeminus [Q] lies a continuation of the gray matter of the posterior spinal cornu. This gray matter is of two kinds, and, perhaps, closer study will reveal a third variety of gray tissue. Of the admitted varieties, one corresponds to what Henle terms the spongy form, and is situated near, and in fact merges into, the reticular gray; the other belongs to the gelatinous variety. The trigeminus nerve being in a constant relation to the gelatinous portion, and the ninth and tenth pairs only, of the three divisions of Willis's eighth pair, passing through and receiving fibers from this portion, conclusively proves the gelatinous nucleus to be related to the sensory peripheries of the pharynx. The cells of the spongy substance, situated meso-ventrad of this nucleus, resemble those of the *nucleus ambiguus*, and in some sections present a nuclear accumulation. Situated so closely to the sensory nucleus of the pharynx, it is probable that we here have its motor nucleus, particularly as fibers can be traced upward which join the efferent trunks of the tenth and ninth pairs.

Taking into account that the three nerves into which the eighth pair of Willis has been divided by Soemmering supply many peripheries conjointly, I think it unfortunate that investigators should seek for the special nucleus of this or that nerve, designated by a given numeral. Meynert made a step in the right direction when he considered the nuclei of the ninth, tenth, and eleventh pairs in the aggregate, and classified the aggregate nuclear masses on the topographical principle. If there is any truth in the notion that, with a given animal species, cells having special connections present a special type of structure, then it will be reasonable to seek for the nuclei of given peripheries. This procedure is far more rational than to seek for the nucleus of a nerve whose component filaments have different peripheral terminations, and are included in the same sheath rather by anatomical accident, as it were, than because of their physiological propinquity. I think it sound to speak of a nuclear column representing the visceral periphery of the vagus, or the gustatory periphery of the glossopharyngeal and intermediate nerve of Wrisberg, or the tactile peripheries of the ninth and tenth, the motor pharyngeal periphery of the same nerves, and the motor laryngeal of the tenth and eleventh pairs. The fact that the fibers of the eleventh pair, which have no relation to the sensory peripheries of the pharynx, and at best but a doubtful relation to the pharyngeal muscles, emerge from the oblongata without passing through the ganglionic mass mesad of the ascending trigeminal root, is as significant in favor of considering this a "pharyngeal" nucleus as the fact that the ninth and tenth pairs do pass through it. And equally bearing on the view here expressed is the further fact that this cell mass merges into the ventral facial nucleus with its large-celled and presumably motor portion, for the facial nerve, through a peripheral anastomosis, supplies certain pharyngeal muscles with motor filaments.

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* Meynert, Stricker's "Handbuch," ii.

In connection with the nuclear formations from which the ninth, tenth, and eleventh pairs originate, it is necessary to study another characteristic feature of the oblongata found at the altitude under consideration, namely, the trineural fasciculus. This term I have given to that cylindrical bundle situated ventrad of the gray substance of the *ala cinerea* and the subendymal auditory nucleus, and known to Clarke, Stilling, and others as the "round" or "solitary" bundle. Krause claims to be able to trace it into the cervical cord, and Goll asserts that it extends as far down as the origin of the phrenic nerve. On the strength of these observations, Krause proposes for it the designation "respiratory fasciculus." I have not been able to confirm the existence of fibers running from this fasciculus into the cord. Although a few may take this course, I am convinced that a greater portion, if it originates in the cord at all, does so in a different manner from that suggested by Krause.

The afferent fibers that join to form the trineural bundle* are derived from the raphé, as Meynert (*loc. cit.*) asserted many years ago. Meynert believes that these fibers [*t*] are derived from the pyramids. The fact is that none can be traced to those columns; the trineural fasciculus receives and gives off fibers for its whole length; the main accession is in the plane of the piniform decussation,† so that, while the fasciculus may incorporate fibers derived from many different sources, the maximum accession must be derived either from the opposite posterior column of the cord, or from the stratum intermedium and lemniscus.

2. *The Ganglion Reticulare.*—This is the proper ganglion of the oblongata; as seen in the diagram, where the thickness of its meshes is exaggerated intentionally, it occupies that part of the reticular field of the oblongata which lies laterad of the hypoglossal roots. Connected with fibers of the tegmental field, with certain spinal tracts, and with some of the cranial nerve roots and nuclei, it is reasonable to assume it to be the center for those rhythmical automatisms which, while under the control of higher centers, involve the activity of both cranial and spinal nerves. The processes of its cells pass in every possible direction, cephalad and caudad, laterad and mesad, but chiefly in the long axis of the cells, which is dorso-ventral. Nothing definite can hence be determined regarding their axis-cylinder processes, of which many of these cells have more than one; and all conclusions regarding the *rôle* played by the ganglion reticulare are based on speculation.

3. *The Great Nerve Strands of the Oblongata.*—As most of these have been rendered familiar to anatomists and neurologists by the labors of Meynert, Forel, Flechsig, and others, I shall limit myself to a mere enumeration of them, except where controversial issues are involved. It may be laid down as a morphological law that those tracts of the oblongata are the lowest and most ancient which are situated near the ventricular floor. That is, the tracts which are found present in the lowest animals, which are earliest in their appearance in the human embryo, and which are connected

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* "Trineural," because its efferent fibers join the roots of the three nerves, viz.: the glossopharyngeal, vagus, and accessory. Its cephalic end passes into that nerve of doubtful function, the *nervus intermedius.* Duval, Bigelow, and myself have advanced reasons for considering this an aberrant ramus of the ninth pair.

† This is the same as the so-called superior fine-bundled sensory decussation of the pyramids of Meynert, now known to have no relations to the pyramids proper. I have recently shown that it is in reality a decussation of the columns of Goll into the *stratum intermedium* ("Chicago Med. Rev.," July 5, 1881), and that, inasmuch as the latter passes to the crus, Meynert's view of a sensory decussation analogous to the motor pyramidal decussation can be reëstablished with some modifications.

with the lower cerebral centers, constitute, so to speak, the core around which the higher tracts are subsequently aggregated.

Immediately ventrad of the subendymal* nuclei we find strands which serve to unite the nuclei with each other, or place them under the subjection of the mesencephalic ganglia. Of such a nature, if my observations are correct, are the posterior longitudinal fasciculus and the trineural fasciculus already referred to. These areas merge insensibly into the reticular field, which is separated into an inner and outer division by the roots of the twelfth pair. In the main, the axial fibers of these fields are derived from the thalamus. The mesal division of the reticular field does not extend to the pyramids, but passes into the field of the *stratum intermedium* [I], the interolivary layer of Flechsig, which in its turn is not clearly separable from a tract situated meso-ventrad of the olivary *nucleus dentatus* [L]. Considerable confusion prevails in the recent writings of Flechsig and Meynert on the derivation of this region. Without entering into a detailed discussion of the conflicting views advanced by these authors, I will record my own observations.

1. The fibers of the lemniscus tract and of the *stratum intermedium* are somewhat mingled, and this in such a way that those of the former tract are chiefly lateral, those of the latter more mesal. 2. Those fibers of the lemniscus tract which can be satisfactorily traced are derived from the postoptic lobes. 3. The fibers of the *stratum intermedium* decussate in the piniform decussation, and are thus connected with the column of Goll of the opposite side. 4. The lemniscus fibers also take part in this decussation, and appear through its mediation to reach the trineural fasciculus. 5. The *stratum intermedium* is in a certain sense a connecting link between the tegmental and pedal tracts of the brain; in the elephant it acts vicariously for the anterior pyramids.

Flechsig has recently questioned the relations of the olivary nuclei to the restiform column. It is true, as Flechsig claims, that the direct lateral myelo-cerebellar tract forms the nucleus of the restiform column [R] through the gradual passage of its fibers [*b*] from the lateral field of the oblongata to the more dorsal position of the myelobrachium,† but the greater portion of the restiform fibers is derived from deeper fasciculi which traverse the ascending trigeminal rootlets or pass up on their mesad side [*c.c.*], and which have taken part in the olivary decussation described by Deiters and Meynert.

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* By this I mean those nerve nuclei which are situated just beneath or near the endyma (ependyma) of the fourth ventricle, in contradistinction to the accessory nuclei situated in the depths of the oblongata.

† The post-peduneulus of Wilder; the *crus cerebelli ad medullam oblongatam* of older authors.

The fibers decussating through the olivary nuclei are chiefly derived from the columns of Burdach. The cerebellum, then, through its posterior peduncle, receives two centripetal tracts—one from the lateral, the other from the posterior columns of the cord. The suggestive problem, therefore, presents itself to the physiologist, whether different qualities of sensation (such as a muscular sense distinct and separate from a tactile sense) are transmitted by these different tracts. There is a remarkable histological correspondence between the basement lamella of the olivary nuclei and the *caput gelatinosum* of the posterior spinal cornu. It is well known that one portion of each posterior nerve root traverses the gelatinous head, while another avoids it, entering either the spongy substance behind it or the columns of Clarke, from which Flechsig derives his direct myelo-cerebellar tract of the lateral column. I am inclined, from this histological fact in part, in part from direct observation, and in part from comparative anatomical studies,* to consider that portion of each sensory nerve root which passes through the gelatinous head as a tactile strand, which is continued cephalad by the column of Burdach, decussates through the olive, and then passes to the cerebellum. Other fibers pass to the fore-brain through the columns of Goll and the *stratum intermedium.* By exclusion, the muscular sense, the existence of which we have every good reason to credit, would be considered as conveyed toward the cerebellum from the columns of Clarke through the tract discovered by Foville and accurately described by Flechsig. With this inference, as I trust to show on another occasion, the absence of the cells of the columns of Clarke in certain parts of the cord does not conflict.

THE CORPUSCULAR ELEMENTS OF THE BLOOD; THEIR ANATOMY AND PHYSIOLOGY, NORMAL AND PATHOLOGICAL.

By ALEXANDER DUANE, M. D.

(*Continued from August Number.*)

Evidence from Pathology.—Certain morbid states regularly associated with alterations of the blood tend to throw some light on this obscure subject of cell genesis. Thus, in *anæmia induced by hæmorrhage* changes occur in the bone-marrow and in the spleen. These parts are seen to be in a state of active proliferation, and to contain nucleated red corpuscles in an amount proportional to the degree of the hæmorrhage (Korn, Bizzozero, Salvioli, Torre). Korn * also found that in birds subjected to bleeding, new medullary tissue developed in the air-holding bones. So in *pernicious anæmia* there are regular changes in the marrow (Cohnheim). Especially characteristic is the appearance here of embryonic erythrocytes, not observable in other parts of the body. Quincke, in five cases of this disease, found an abnormal amount of iron in the liver and the hepatic capillaries, indicating either an excessive destruction or impaired regeneration of the erythrocytes in this organ. These changes, however, are by no means idiopathic, as they are found in many chronic wasting diseases. But in all cases a change in the quality of the blood seems to run parallel with the changes in the bone-marrow. Again, long-continued splenic enlargement results in a severe form of anæmia, which we should be inclined to attribute to a disturbance of the normal function of this organ.† *Melanæmia* also appears to be closely connected with a lesion of the cytogenous organs. The deposit of pigment is found most extensively in the spleen, liver, and bone-marrow,‡ and there have been observed in the blood spindle-shaped masses, which are thought by some to be the peculiar, sickle-shaped endothelial cells of the splenic veins. In *leucocythæmia* there are always some changes, either in the spleen, the lymphatic glands, or the bone-marrow. These can not be regarded as accidental coincidences, because the lesion of the cytogenous organs is always proportional to the degree of blood change and to the severity of the symptoms;# and, furthermore, objective signs referable to these organs frequently usher in the disease. Nor does the lesion consist in a mere passive accumulation of white cells deposited by the overladen blood; on the contrary, an active process seems to be going on which results in the formation of new tissue and new cells. Of course, in this and in the other diseases mentioned the doubt still remains whether the blood change is the cause or the effect of the organic lesion. And, while there are some reasons for believing the latter to be the true relation in many cases, in some instances at least the converse is equally true. At any rate, the facts adduced prove sufficiently well that there is

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* In the porpoise the posterior columns are in a natural atrophy, though the muscular sense of this animal must be exquisite. The lateral column is large; the gelatinous head of the posterior cornu much reduced.

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* "Centralbl. f. d. med. Wiss.," 1880, 41.

† F. von Niemeyer's "Lehrb. der spec. Path. u. Therap.," 10th (Seitz's) ed., i, p. 813

‡ Arnstein, "Arch. f. path. Anat. u. Physiol. u. f. klin. Med.," lxi, p. 500.

Lodi, "Riv. Clin. di Bologna," February and March, 1880.

a relation of some sort between the condition of these organs and the blood state.

Most Probable Theory of Cytogenesis.—A review of this lengthy sketch of the data of our problem will, we think, bring us, if not with certainty, at least with considerable probability, to the following conclusions:

I. The white corpuscles are developed mainly from the lymphatic glands and the spleen, and probably also from the red marrow of the bones. They are produced by the proliferation of preexisting cells. They either enter the blood under their own form, or are used up in the formation of the red cells.

II. The red corpuscles are developed from the red marrow, and, to some extent, from the spleen. They also are products of cell-proliferation, being derived either from the white corpuscle or from a cell allied to the latter. If, with Arndt and others, we adopt the second view, we assume that a primitive, homogeneous mass of protoplasm becomes more and more differentiated, until at a certain stage it either takes up hæmoglobin and becomes an erythrocyte, or keeps on in its development and becomes a white corpuscle. Thus regarded, the white corpuscle is a sort of by-product in the formation of the red. Of a similar character are the medulla cells, and, perhaps, the myeloplaxes of the red marrow.

III. The destruction of the red corpuscles is accomplished in the liver, the spleen, and the bone-marrow. In the first of these organs it is not accompanied by any regenerative process; in the second, regeneration and destruction nearly balance each other; in the third, the formative power far exceeds the destructive.

These statements represent probably the views of the majority of physiologists to-day. The theory which they constitute has been gradually developing during thirty years, its inception dating from the discovery of leucocythæmia by Bennett and the invention of instruments for the accurate enumeration of the blood cells. It received a great addition some fifteen years later, when Neumann discovered myelogenous leucocythæmia and the blood-elaborating function of the bone-marrow. At present the matter is constantly under investigation, and every day new facts, either confirmatory or opposing, are brought to light. The theory, therefore, is provisional only, and does not yet admit of certain demonstration. Indeed, there are facts which seem to militate against it, and which must be explained away before it can be received in its entirety. On this account many physiologists have refused to accept it, and have proposed substitutes more or less plausible. Our consideration of the subject would be incomplete if we did not devote some time to the consideration of these opposing claims.

Theory of Flint.—Flint is, perhaps, the most representative supporter of the doctrine that the blood corpuscles are produced without the intervention of any special organs and without requiring the presence of preëxisting cells. His objections to the theory which we have just stated may be thus formulated: *

1. The theory, especially as regards the formation of red from white cells, has no positive evidence in its support.

2. Such a method of formation does not obtain in the fœtus, in which the development of the corpuscles precedes that of any of the cytogenous organs.

3. The lymph contains leucocytes before reaching the lymphatic glands.

4. The experiments of Onimus prove that leucocytes can be produced in a filtered fluid which is allowed to communicate with living tissues by osmosis but not by contact.

On the strength of these arguments, and rejecting, as he does, the cellular theory of histology, he maintains that the corpuscles of both kinds are formed by a "true genesis in the sanguineous blastema," and that this mode of origin holds good for the fœtus as well as the adult.†

If, now, we take up his objections seriatim, we may observe:

1. His theory, in its nature, is at least as difficult of conception as the one which he controverts, and requires for its acceptance proof quite as precise; and such proof he does not adduce to offset the direct evidence which holds for the current view, and which has been already sufficiently detailed. Moreover, his conception of cell genesis is opposed to all our ideas of the way in which tissues are produced; it being almost an axiom, in human histology at least, that every cell is derived from a parent cell. If his theory is correct, it presents the only instance known to us of the formation of a definite anatomical element by the spontaneous aggregation of particles.

2. In the fœtus, at any rate, the corpuscles are formed from preexisting elements and not by spontaneous genesis in a liquid blastema. Again, as we have already pointed out, the modes of cell formation, like all the vital processes, must be very different in the adult and in the fœtus; and, consequently, the non-existence of cytogenous organs in the latter proves nothing as to what takes place in the former.

3. The occasional presence of leucocytes in the lymph before

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* "Text-Book of Physiology," 1881, pp. 12 to 16.

† Page 13.

entering a lymphatic gland is, as we have seen, little proof that the latter is not the seat of a cytogenetic process. ·

4. The experiments of Onimus admit of a different explanation from that which Flint has given; the leucocytes, instead of being spontaneously generated within the fluid, may have passed into it from the surrounding tissues. The abundance with which they were produced would, perhaps, be explained by the irritation which the insertion of a foreign body beneath the skin would naturally excite. The conditions of the experiment, as given by Flint, appear to favor this interpretation. It is well known that leucocytes can, by their amœboid movement, pass through very thick animal membranes, the necrosed walls of a ligated artery, for instance;* and it seems quite likely that a similar process took place in the experiment of Onimus.

The crowning objection to Flint's theory, as it seems to us, is that it offers no explanation of the changes which the blood experiences in passing through the cytogenous organs, nor of the transition forms observed in the bone-marrow and in the spleen. This insufficiency to account for the observed facts, as well as the absence of any direct evidence in its favor, should make us cautious in accepting this hypothesis, especially so when another is presented which is more satisfactory in both particulars.

Theory of Hayem.—The ideas which Hayem † has recently broached on the development of the red corpuscles have already been touched upon. A brief recapitulation will, however, be made here in accordance with the plan already marked out. According to this author, then, certain bodies are formed in the protoplasm of the colorless corpuscles of the lymph, and are afterward extruded by means of amœboid movements taking place in the latter. These bodies, thus set free, enter the blood, acquire hæmoglobin, increase in size, and ultimately form the fully-developed erythrocytes; they are hence called hæmatoblasts, or blood (cell)-formers. Hayem has seen lymph corpuscles containing hæmatoblasts in the lymph of several of the mammalia, and has observed the hæmatoblasts themselves in human blood. After diseased conditions in which the red corpuscles are diminished, the share which the hæmatoblasts take in the process of repair is shown by their appearance in considerable excess of their usual number. ‡ This is so marked in acute inflammations as to constitute an "hæmatic crisis," occurring, in all cases, just after resolution has set in.

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* Cornil and Ranvier, "Pathological Histology," Shakespeare and Simes's translation, 1880, p. 321.

† "Arch. de Physiol.," v, 1878, p. 692, and vi, 1879, pp. 201 and 577.

‡ "Progr. Méd.," Dec. 6, 1879; "Courrier Méd.," March 27, 1880.

These statements have been brought forward too recently for either full confirmation or disproval by other physiologists. Hayem alleges the extreme delicacy of the hæmatoblasts as the reason for their not being previously recognized, although, he says, one or two authors have described similar bodies under other names. Indeed, it has been questioned whether some of the bodies, known as microcytes or elementary corpuscles, are not these same developmental forms of Hayem. But Obrastzow * concludes from his investigation of the matter that the hæmatoblasts are not identical with the true microcytes, which are immature red corpuscles, for they differ markedly from these bodies in reaction to staining agents, etc.; but are rather the minute particles, described by Zimmermann, which are conceded to be the fragmentary remains resulting from the decomposition of the erythrocytes. The whole matter, however, needs additional investigation to settle the question of the existence of the hæmatoblasts and of their mode of origin.

It is interesting to compare with this theory a similar one advanced as long ago as 1852 by Bennett,† the discoverer of leucocythæmia. He supposed that the corpuscles of all kinds were formed in the spleen and the lymphatic structures; the red corpuscles being free nuclei, which were partly developed as such in these organs, partly produced in the interior of the colorless lymphoid cells. Most of the latter bodies were used up in this way to form erythrocytes, but some, on reaching the general circulation, remained under their own form as white blood corpuscles.

The theory of Foà and Salvioli, which has already been referred to once or twice, closely resembles that of Bennett. They hold that the erythrocytes are the extruded nuclei of a sort of giant-cell, each nucleus as it escapes carrying with it a little homogeneous protoplasm. They differ from Bennett in ascribing the production of the parent cells to the bone-marrow as well as to the spleen, and in denying that the lymphatic glands have anything to do with the formation of erythrocytes after embryonic life.

The hæmatoblast theory, as the modifications of it just described demonstrate, is quite compatible with the assumption that special organs exist for the purpose of forming the corpuscular elements. Nevertheless, Hayem rejects this assumption, though on what grounds he bases his rejection we do not know. He has, it is true, expressed the opinion ‡ that the transition forms observed in the

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* *Loc. cit.* † Quoted in "Brit. and For. Med.-Chir. Rev.," April, 1853.

‡ "Gaz. Méd.," March 6, 1880.

marrow and elsewhere are nothing more than white corpuscles which have imbibed hæmoglobin, and do not indicate any true process of development. Of this it may be said that such an explanation is altogether inadequate in view of the multiplicity of forms observed and the gradations by which they pass into one another so as to form one unbroken series.

Other Theories.—We have now gone through all the principal theories of cytogenesis which differ from each other in any radical degree. But variations of opinion also exist in regard to minor points in the process of development. For instance, while a large number of physiologists are agreed as to the derivation of the red corpuscles from the white, some assert that the former are the escaped nuclei of the latter, others that they are the product of the cell body alone. The former view was held by Huxley, Wharton Jones, and Vogt; and, as we have just seen, by Bennett and by Foà and Salvioli. It is based partly on theoretical grounds, such as the correspondence in size and form between the nucleus of the white cell and the body of the red corpuscle throughout the mammalian series;* partly on the results of direct microscopical observation. On the other hand, the majority of histologists, including some of the most distinguished students of the science, adopt the contrary view. Thus, as the result of their own microscopical investigation, the extra-cellular theory has been set forth by Paget, Schmidt, Kölliker, Neumann, Rindfleisch, and Obrastzow. The latter, who, it will be remembered, does not believe in the existence of the nucleus as such, yet allows that when a red corpuscle is formed even the "nuclear matter" found in the parent cell disappears. The parent cell in this case is the hæmatoblast of the bone-marrow, which possesses a small amount of nuclear matter and is itself derived from colorless cells, in which the nuclear matter is abundant. These colorless cells, which give origin both to the hæmatoblasts and to the medulla cells proper, spring, in their turn, from "protoleucocytes," which are made up almost entirely of nuclear matter ("free nuclei"). So that the process begins with a body which is all nucleus, and, by the gradual addition of protoplasm and hæmoglobin, and the abstraction of nuclear matter, finishes with a non-nucleated cell. So, too, Rindfleisch, in observing the process of development in the marrow, saw the nuclei of the hæmatoblasts escape and atrophy, while the cell body assumed a bell-shaped form, then became flattened, and finally took on the form of a red corpuscle.† It must be allowed, however, that, although in the adult the corpuscles seem to be developed by the extra-nuclear process, in the fœtus quite the reverse holds good. In the early stages of embryonic growth, when the corpuscles are derived from the cells of the mesoblastic layer, they represent the free nuclei of these cells, and appear to be developed in very much the way which Foà and Salvioli describe (Ranvier). But the corpuscles produced at this time are themselves nucleated, while those developed in after-life are not; and this difference, along with others, prevents our applying to the erythrocyte of the adult the law of growth which holds for its predecessor in the fœtus.

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* Wharton Jones, quoted by Foster.

† It seems likely that, while Rindfleisch was right as to the fact of the disappearance

Other methods of cell genesis are occasionally described. That which occurs in the liver and lymphatic glands during intra-uterine life has already been mentioned. In the former organ the process may possibly persist until later life. A development of the corpuscles from the nuclei of the vascular wall takes place in the chætopoda;* but the cells so formed do not contain the hæmoglobin which is found in the blood of these creatures. They are not, therefore, strictly analogous to the erythrocytes in man; and in man this process has not, we think, been observed, for the erythrocytes at least. The latter reservation is made because Shakespeare † thinks that he has proved that a portion of the leucocytes produced in inflammation are derived from the endothelial cells of the vessels. Another possible method for the formation of erythrocytes is shown in the cases already cited from Creighton. Here, as will be remembered, a reversion to the process of early fœtal life took place, the corpuscles being produced from newly formed, indifferent connective-tissue cells. It is worthy of note that in his case the corpuscles so generated differed from those of the embryo in not being nucleated, and in being manufactured from the body instead of the nucleus of the primordial cell. Schäfer ‡ noticed in newly-born animals similar instances of blood-cell formation in connective-tissue elements. Here the corpuscle was developed within a connective-tissue cell by a process of deposition in much the same way as a fat cell is formed; and it is a curious fact that in regions where the corpuscles were produced in this way fat cells were afterward found to exist. Such a statement gives some color to the idea of Drummond,# that in the development of erythrocytes from embry-

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of the nucleus, he was mistaken in the method by which this is effected. It is probable that the nuclei are removed by intra-cellular disintegration, their bodily escape being observed only as a post-mortem phenomenon.

* Lankester, "Quart. Jour. of Microsc. Sci.," 1880.

† Translation of Cornil and Ranvier, "Pathological Histology," p. 59.

‡ *Loc. cit.*

# Quoted in "Brit. and For. Med.-Chir. Rev.," Oct., 1855.

onic cells the hæmoglobin is formed from [replaces?] the fat. Finally, as Foster points out, the leucocytes may originate from any tissue which is in a state of active proliferation. Besides the example which he cites from Klein, the cases observed by Shakespeare and mentioned above are probably instances of this law.

Deductions from the Law of Cytogenesis.—Before closing this sketch of cell development, one general fact remains to be noted. It is this. The blood cells, whatever their special seat of origin, seem in the primordial development to be *connective-tissue elements.* In the embryo they take their beginning from the cells of the mesoblastic layer, which is the common source of all the structures of the connective-tissue type. Afterward, whether originating primarily from the lymphatic glands, the lymphatic follicles, or the spleen, the white corpuscles, and consequently their derivatives, the red corpuscles, are produced by the proliferation of connective-tissue cells. And even the further transformation of white into red corpuscles in the bone-marrow is effected in a tissue which closely resembles, if it is not identical with, the adenoid type of structures. The identity of the white corpuscle with the wandering connective-tissue cell is evidence tending in the same direction. And, if the material of repair is justly regarded as made up of the exuded elements of the blood, the connective-tissue formations which are the result of its organization indicate both the histological character of these elements and their capability of reversion to their original type. Here, by a sort of physiological synthesis, we are able to reconstruct from the element whose development we have analyzed the combination from which it sprang.

Again, the development of red corpuscles from ordinary leucocytes, or from still more primitive cells, is analogous to the mode of production of formed tissue everywhere. "Indifferent" cells, round, mobile masses of undifferentiated protoplasm, possessing great activity but a low vitality, are transformed into cells of greater stability of form and complexity of structure, and at the same time of a higher vitality. By this process all the tissues in the body are formed in the growing embryo. The same holds good for the organization of all new growths and inflammatory formations. The corpuscles, then, in taking on this mode of development, are only following a law which governs all forms of growth. A deduction of some pathological interest results from this fact. It is well known that in tissues of every kind, new growths especially, the rapidity with which they increase, and likewise their instability, are proportional to their lack of organization. In other words, a lowly-organized growth possesses a greater amount of vital activity, but of a lower grade than does a growth more highly organized. Carrying this principle in our minds, we might be led *a priori* to the conclusion that when the general system is in a state of morbidly-increased activity the blood itself will present an excess of the lowly-organized elements—i. e., the white corpuscles. This is found, in fact, to be the case, and the condition which we call leucocytosis, and which is characterized by a slight excess in the leucocytes, is the regular accompaniment of febrile and inflammatory action. Under these conditions the white corpuscles share in the general increase of tissue metamorphosis; they are produced in greater numbers. But their further transformation into the more stable and highly-organized red corpuscles is prevented; the vital activity which has carried them so far, though strong to excess, is not lasting; and so they either disintegrate or escape from the vessels and form pus. This process is comparable to that taking place in a new growth, which is constantly forming and constantly breaking down; in both there is the same great but misdirected and wasteful energy, and in both the consequent drain upon the system may be severe. Of course this analogy does not hold with regard to leucocythæmia, which, far from indicating any general alteration of vital activity, is to be referred to some local derangement of function.

Destiny of the Corpuscles.—The prevalent view in regard to the destiny of the erythrocytes has already been given in an incidental way, along with some of the data upon which it is founded. In recapitulating it here, the description of Quincke[*] will be adopted, as giving the most satisfactory explanation of the process that has yet been offered. This author experimented by injecting the blood of one animal into the veins of another, and afterward testing the various tissues for the iron deposited by the breaking up of the hæmoglobin. From the results which he thus obtained he concludes that the worn-out erythrocytes are taken up by the white corpuscles and by the characteristic pale cells of the red marrow and spleen, to be deposited in the capillaries of these organs, and also in the liver. Their arrest in these localities is ascribed to the slowness with which the blood circulates through these organs. The encapsuled erythrocytes, once lodged, undergo various changes, the products of their decomposition being partly excreted, especially in the liver, partly employed in the formation of new cells. We can thus see why, under normal conditions, there is an excess of iron and pigmentary matters in these organs, and also why this excess should become enhanced in diseased conditions attended with an increased destruction of erythrocytes. The coloring matter which is set free by this process assists, after the loss of its iron, in the formation of all the pigments in the body, including those of the bile, urine, skin, choroid coat, etc. The apparent identity of the hæmatoidin found in blood clots with bilirubin, the increased formation of the latter after the injection of hæmoglobin into the blood, and its decrease after removal of the spleen, are arguments in favor of this view. These points, to be sure, are controverted by some; yet the balance of evidence seems to be on the side of the theory indicated.

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[*] "Dtsch. Arch. f. klin. Med.," Nov., 1880.

Other explanations have been advanced from time to time to account for the disappearance of the decomposition products of the erythrocytes. Thus, urea[*] and fibrine[†] have been considered to represent the final results of their metamorphosis. Again, many believe that the red corpuscles disappear by solution in the blood stream, and that no special organ is required for their destruction.[‡] Of course, nearly the same arguments apply to this view as to the corresponding one for the formation of blood cells; although the evidence for the existence of an organ which destroys the erythrocytes is not as cogent as that for the existence of one which produces them.

The leucocytes are supposed by most observers to be used up in the formation of the red corpuscles. Arndt, who holds that the true white corpuscle is a by-product in the formation of the red, and others, who do not believe that the red cells are formed from the white, acknowledge a different mode of termination for the latter. The way in which this is effected, however, is very obscure. The leucocytes are thought to contain the fibrine-ferment, and consequently their disintegration should be an important factor in the coagulation of the blood. It will be remembered that Hayem assigned a similar property to his hæmatoblasts.

Life of the Erythrocytes.—Quincke, by the method above described, fixed the life of the red corpuscle as not less than two or three weeks.

The corpuscles, as they become older, doubtless suffer decadence. Accordingly, forms of degeneration have been observed; the corpuscle-holding cells of the spleen, and by some the giant cells of the marrow, are thought to be such stages in the life of an erythrocyte. The older corpuscles are said to be less resistant to reagents, and to present peculiar appearances when treated with coloring matters. Quincke ascribes the facility with which the effete erythrocytes are taken up by the white corpuscles to the loss of smoothness and other alterations in physical character which the former experience in their old age.

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[*] Führer and Ludwig, Vierordt's "Arch.," xiv, 1855.

[†] Bennett, in "Brit. and For. Med.-Chir Rev.," April, 1853.

[‡] Pouchet (in the triton), "Jour. de l'Anat. et de la Physiol.," xv, 9; Flint; Robin.

(*To be continued.*)

REPORT OF THE COMMITTEE ON RESTORATIVES, OF THE THERAPEUTICAL SOCIETY OF NEW YORK, ON THE USE OF QUEBRACHO IN DYSPNŒA.*

By ANDREW H. SMITH, M. D.,
CHAIRMAN OF THE COMMITTEE.

The aspidosperma quebracho is a tree belonging to the apocynaceæ, found in the province of Catamarca, in the Argentine Republic, where the local name is *quebracho blanco*. The bark is used by the natives as a remedy for malaria and asthma. "It is a tall tree, with perfectly straight trunk two or three feet in thickness, with a moderately large oval crown and sparse foliage, the extreme twigs being fine and pendent as in the willow. The bark occurring in commerce is obtained from trees averaging seventy to eighty years of age, the pieces having a thickness of 20 to 30 millimetres (about one inch). It is distinguished by a peculiar thickness of the external, corky layer, which constitutes half, or more than half, the thickness of the bark."—Hansen.

There are in commerce, also, the wood and bark of an entirely different tree from the same locality, known by the natives as *quebracho colorado*, or red quebracho, and used for tanning leather. This has doubtless been substituted for the quebracho blanco in some cases, while possessing none of its properties.

Quebracho was first brought to the notice of the profession by Dr. F. Penzoldt, of Erlangen, in 1879. While investigating its supposed antipyretic properties, for which it has been employed in Brazil—but which Dr. Penzoldt discredits—he accidentally discovered that it possessed a remarkable power to retard the pulse and respiration and to relieve dyspnœa.

In his experiments upon animals, Dr. Penzoldt found that the action of the drug varied considerably with the animals employed.

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* Read before the Medical Society of the County of New York, June 27, 1881, by O. B. Douglas, M. D., Secretary of the Therapeutical Society.

Thus, in frogs there were produced complete motor paralysis of central origin, respiratory paralysis, and slowing of the pulse. In rabbits and dogs motor paralysis and dyspnœa resulted, increasing in proportion to the dose employed. In the rabbit the respiration was retarded and rendered deeper, while in the dog it was quickened. In dogs, as in some human subjects, salivation was produced.

In testing the antipyretic action of quebracho upon a patient with pleurisy and emphysema, Dr. Penzoldt was surprised to find that, while the fever was not diminished, the dyspnœa under which the patient was laboring was notably relieved.

He was thus led to test the effect of the drug in dyspnœa depending upon a variety of causes, such as phthisis, pleurisy, bronchitis, etc., and the results were highly satisfactory. His paper was published in the "Berliner klinische Wochenschrift," No. 19, for 1879, and an abstract of it in "The Medical Times and Gazette" for July, 1879. "New Remedies" for April, 1880, also published an article upon this subject.

The observations of Dr. Penzoldt were followed up by Dr. Berthold, of Dresden, and Dr. Picot, of Carlsruhe, in the "Wochenschrift," No. 52, for 1879. Dr. Berthold employed quebracho in two cases of spasmodic asthma. In the first the respirations fell, after using three doses, from 64 to 30, with general improvement of the symptoms. In the second case, in which emphysema was present, the result was also very satisfactory. In mitral stenosis and incompetence, as also in fatty heart, the relief to the dyspnœa was marked. In chronic bronchitis and in the latter stages of phthisis the result was, in the main, unsatisfactory; yet in two cases of the latter the relief to the dyspnœa was wonderful. In one of these cases the respiration fell from 52 to 28, after teaspoonful doses of the extract given every two hours.

Dr. Picot obtained good results in three patients with catarrhal pneumonia, bronchial asthma, and cardiac disease, in which dyspnœa was urgent. He also experimented upon himself as to the effect of quebracho upon shortness of breath in climbing mountains. On three successive days, the temperature and barometer continuing nearly unchanged, he ascended to the same height in the same period of time. He found that without quebracho his respiration rose from 16 to 42, and his pulse from 64 to 94, while with quebracho the respirations reached only 30 and the pulse 80, and his condition was every way more comfortable.

This experiment suggests to your reporter that the drug might be used in rowing-matches, foot-races, etc., and even be given to horses about to run, thus conferring an unfair advantage.

The committee is greatly indebted to its distinguished member, Dr. Squibb, for his liberality and zeal in placing at its disposal a preparation of quebracho which could be relied upon with perfect confidence. Although the drug is not upon the list of those manufactured in his laboratory, he had a fluid extract prepared under his personal supervision, expressly for the committee, from specimens of the bark selected by himself. This extract was used in the greater number of the cases forming the basis of this report. In the remainder a fluid extract prepared by Park, Davis & Co., of Detroit, was used, which evidently represents the active principle of the drug. The extract is very bitter and somewhat astringent, and the taste lingers a long time in the mouth. In persons with sensitive stomachs it is apt to excite nausea. The dose usually employed is *half a drachm*, which may be repeated several times a day.

This report embraces thirty-two cases observed by members of the society and others, as follows, viz.:

Two cases by Dr. A. V. B. Lockrow.—One, emphysema and bronchitis; and one, asthma, emphysema, and bronchitis. Both relieved.

Six cases by Dr. J. A. McCreery.—One, mitral insufficiency, with no benefit; one, bronchitis, with great obesity, no relief; one, chronic bronchitis; two of asthma and bronchitis; and one, bronchitis, with consolidation at apex of one lung. The last four, dyspnœa relieved.

Four cases by Dr. R. T. Bang.—Two of spasmodic asthma and one of aortic aneurism, dyspnœa relieved; one of cardiac disease, in which there was some relief.

Two cases by Dr. C. W. Packard.—One, mitral stenosis, and one, cardiac hypertrophy, with dilatation, neither of which was relieved.

One case, by Dr. W. R. Birdsall, of tonsillitis, in which dyspnœa was relieved.

One case, by Dr. F. A. Burrall, of Bright's disease; dyspnœa relieved.

Eight cases by Dr. L. Emmett Holt.—One case, cancer of lung, dyspnœa relieved; four cases, asthma and bronchitis, two relieved and two unrelieved; one case, each, pneumonia following infarction, pleuro-pneumonia, and Bright's disease with œdema of lung, all of which were relieved.

Four cases by Dr. J. T. Duffield.—One of fatty heart, with slight relief; one, catarrhal phthisis, second stage, dyspnœa relieved; one, catarrhal phthisis, third stage, no benefit; one, intermittent fever and old pleurisy in an opium-eater, dyspnœa increased.

Two cases by Dr. G. Bayles.—One of cardiac disease and asthma, and one hysterical dyspnœa; in both cases, dyspnœa relieved.

Two cases by Dr. A. H. Smith.—One, mitral insufficiency, no benefit; and one, asthma with pleuritic adhesions, dyspnœa relieved.

Cases by Dr. A. V. B. Lockrow:

Case I.—Mrs. M. came, March 2d, to Demilt Dispensary. Had had a bad cough, more or less, for two years—severe during last summer. Complains of shortness of breath. Temperature 100°, pulse 80, respiration 30 to 32. Diagnosis: emphysema and bronchitis. Gave her cod-liver oil with spir. æther. comp.; also fl. ext. quebracho, gtt. xxx t. i. d.

March 7th.—Patient much relieved. Temperature 99°, pulse 80, respiration 28. Cough better.

Case II.—Patrick D., 70 years of age, came to Demilt Dispensary May 9th. Plasterer by trade, sick three months. Short of breath for several years. Cough at present severe. No appetite. Pulse very irregular and weak. Diagnosis: asthma, emphysema, and bronchitis, with cardiac hypertrophy. Has frequent and severe attacks of asthma, and can not sleep. Gave fl. ext. quebracho ♏xxx t. i. d. Also inf. digitalis ℥ ss. twice a day.

May 11th.—Patient very much improved. Slept well after taking first dose—for the first time since December 13th. The improvement is very marked. Pulse still irregular, but fuller and stronger. After taking fourth dose of quebracho, took food with a relish for the first time in several weeks.

Cases by Dr. J. A. McCreery:

Case I.—Mrs. G., 40 years of age. Palpitation and shortness of breath on going up stairs, for two years. Loud mitral regurgitant murmur. Pulse irregular and weak. Dyspnœa great on the least exercise. Ordered fl. ext. quebracho, ♏xxx t. i. d. No appreciable benefit after about ℥ ss. had been taken.

Case II.—Mrs. L., 74 years of age. Very stout—can walk but a few steps at a time, and then only with assistance. Has had several apoplectic strokes, one of which nearly proved fatal. Articulation greatly impaired. Bronchitis since October, 1880, general. Prolonged respiration. Frequent attacks of dyspnœa about 3 a. m., lasting half an hour or longer, during which she has to sit up. Ordered fluid extract of quebracho, ♏xxx t. i. d. No improvement after several days. She refused to continue the medicine on account of its bitterness.

Case III.—Laborer, 65 years of age. Bronchitis for years, and several attacks of asthma; sibilant and mucous râles over both lungs. Expiration greatly prolonged; can not lie down. Fluid extract of quebracho, ♏xxx t. i. d., gave much relief and enabled him to sleep part of the night. Failed to report after getting second supply of the medicine.

Case IV.—Mrs. L., 67 years of age. Has had two attacks of bronchitis with asthma. During last three weeks has had severe cough, and for ten days respiration difficult, especially at night. For a week has not been able to lie down. Hoffmann's anodyne and morphine gave only partial relief. Pulse 112°. Râles over both lungs; prolonged expiration. Ordered fluid extract of quebracho, ♏xxx, whenever breathing got bad. First dose gave almost complete relief for two hours. Took the drug three nights, always relieving her so that she was able to lie down and sleep. One night took the medicine twice. In this case it is to be noted that improvement had commenced before quebracho was given. Yet the effect of the drug was very striking.

Case V.—Woman, 70 years of age, suffering from an exacerbation of an old chronic bronchitis. Breathing short and labored; orthopnœa at night. Expiration prolonged. Quebracho gave great relief—enabling her to lie down and sleep. She required one or two doses every night.

Case VI.—A young woman, who had slight attacks of orthopnœa from bronchitis, with some consolidation at apex of one lung. Quebracho seemed to give relief for a time, but the patient was too stupid to give a very clear history.

Cases of Dr. R. T. Bangs, House Physician, St. Luke's Hospital (service of Drs. A. H. Smith and G. G. Wheelock):

Case I.—J. O., 28 years of age. Spasmodic asthma. Had used iodide of potassium, stramonium, nitre papers, nitrite of amyl, belladonna, chloral, etc., without much benefit. Fl. ext. quebracho, ♏xx, were administered, t. i. d., and afforded immediate relief—so much so that the patient left the hospital in a few days, provided with a prescription for the drug.

Case II.—42 years of age. Aortic aneurism. This was a man upon whom treatment with an Esmarch bandage was twice employed, under ether, for the cure of a popliteal aneurism. The first time the bandage was left on for an hour and a half, and the second time for two hours. After the bandage had been removed a tourniquet was each time applied to the femoral artery for an hour. Both these attempts proved unsuccessful. Treatment by flexion was next tried, but was also of no avail. Finally ligature of the femoral cured the popliteal aneurism. While the patient was under ether it was noticed that he was very cyanotic, but when the effect of ether had passed away the cyanosis also disappeared. Ten days after the femoral had been ligated the patient developed dyspnœa. Fluid extract of quebracho was given, ♏xv t. i. d., and gave much relief. He remained in the hospital twenty-seven days longer, during which time the quebracho continued to benefit his dyspnœa. Fifteen days later he was readmitted with some dyspnœa; ʒ ss. t. i. d. relieved him again. After taking it for two weeks the use of the drug had to be stopped because no more of it could be obtained. For a fortnight he took other remedies with but little and temporary benefit. At the end of that period the use of quebracho was resumed, ʒ ss. t. i. d. By this time the patient was markedly cyanotic, and his dyspnœa was almost continuous. The dose was increased to ʒ ss. every four hours, but no benefit resulted. The patient died, and at the autopsy a large aneurismal tumor was found pressing upon the trachea, very much narrowing the lumen of that tube.

Case III.—H. B., 48 years of age. Spasmodic asthma of many years' standing. Fluid extract of quebracho, ʒ ss. t. i. d., was at once prescribed, and gave marked and permanent relief.

Case IV.—F. L., 70 years of age. Cardiac disease. Fluid extract of quebracho, ʒ ss. t. i. d., given with some slight benefit. Patient died ten days after the administration of the drug had been begun.

Cases reported by Dr. C. W. Packard:

Case I.—Henry J. K., 39 years of age. Mitral stenosis with hypertrophy; moderate bronchitis; dyspnœa constant; at times orthopnœa lasting through successive days and nights—the patient catching only occasional snatches of sleep in the sitting posture. Administered Squibb's fluid extract quebracho, ʒ j dose, every four hours. The third dose was vomited, also the fourth. Discontinued the medicine till next day, when it was repeated with the same experience. No effect on the dyspnœa.

Case II.—George W. F., 50 years of age, railroad superintendent, temperate, suffering from hypertrophy with dilatation. Mitral disease suspected, but not made out. Heart's action irregular and at times tumultuous. No evidence of renal disease. Orthopnœa at times, persisting for days and nights, and marked dyspnœa at all times. Fluid extract quebracho, in ʒ j dose, every four hours, had no apparent effect upon the dyspnœa. At the end of twenty-four hours the medicine was suspended, as it was no longer retained by the stomach.

Both of these patients complained of the nauseousness of the quebracho. And in many like cases its offensive taste must act as a bar to its administration by the mouth.

Case reported by Dr. W. R. Birdsall:

Mrs. S., aged 32. Severe follicular tonsillitis; tonsils coming in contact in median line and producing mechanical interference with respiration. Dyspnœa severe, causing great anxiety on the part of patient and attendants. I was satisfied, however, the attacks of dyspnœa were not dependent entirely upon the mechanical obstruction, but were due largely to an excitability of the respiratory centers. ʒ j fl. ext. quebracho, administered during an attack, speedily relieved the dyspnœa, which did not return for about twelve hours, while before its administration the attacks recurred at intervals of ten or fifteen minutes. The same dose was repeated at intervals of twelve hours, being given as soon as possible after the beginning of an attack. In every instance relief followed in a very few minutes, the medicine apparently preventing a return of the dyspnœa for nearly twelve hours. Tumefaction of the tonsils having become reduced, there was no further use of the remedy after the fourth dose.

Dr. F. A. Burrall's case of chronic Bright's disease, in which there was marked dyspnœa, associated with œdema of the lower extremities. Patient took fluid extract of quebracho, in ʒ j doses, t. i. d., with the effect of averting the attacks or diminishing their severity. When he took the medicine without water the effect was more decided, although it produced considerable irritation of the fauces.

Cases reported by Dr. L. E. Holt, of Bellevue Hospital:

Case I.—Cancer of the breast; secondary deposits in the lungs; old pleurisy with adhesions. Female, aged 53. Constant dyspnœa, which was increased paroxysmally, and so severe at night as almost to preclude sleep. I have special notes of only three nights in which the quebracho was used. *March 18th.*—Two ʒ ss. doses were given at bedtime, when she was breathing with great difficulty. Improvement was noticed in a short time, and patient said next morning she got great relief from it. *19th.*—Two doses, one hour apart, with same result. *20th.*—Very marked improvement noticed by nurse after second dose. Respiration fell from 40 to 28, and patient went to sleep. During her stay in hospital, one week longer, quebracho was used, always with relief.

Case II.—Bronchitis (chronic) and spasmodic asthma. *Apr. 5th.*—Female, 60. Breathing so badly that she could not lie down or go to sleep. No relief till the second ʒ ss. dose was given; then the breathing was noticed to be much easier. Fell asleep; slept for an hour. The third dose was then given, and patient slept well the rest of the night. Left hospital next day, and the drug was not used further.

Case III.—Acute pneumonia following infarction. Male, 45. Quebracho was given at the very inception of the disease, before the physical signs of pneumonia appeared. *March 24th.*—Marked dyspnœa, and complains of sense of suffocation. Three ʒ ss. doses gave complete relief, lasting several hours. *25th.*—The drug given without any effect whatever, and it was discontinued. Patient died two days later.

Case IV.—Pleuro-pneumonia of left side; dry pleurisy of right. Female, 35. Respirations quick and very labored. Three ʒ ss. doses gave very marked relief, lasting about eight hours. Patient died a day or two later.

Case V.—Bronchitis, emphysema, and asthma. Male, 64. Breathing habitually labored. No paroxysms of marked severity. Quebracho given two nights, three doses, ʒ ss. each, without perceptible benefit. Discontinued.

[The notes of the following three cases were furnished by Dr. William B. Anderton, House Physician Third Medical Division.]

Case VI.—Male, 38. Bronchitis, emphysema, and asthma, the latter being almost entirely paroxysmal, and the paroxysms being of extreme severity. On three occasions quebracho was given in ʒ ss. doses every half-hour for two hours, without the slightest benefit. Nearly the whole list of antispasmodics was gone through with, and nothing but morphia was found to do any good.

Case VII.—Male, 54. Bronchitis, emphysema, and asthma. Paroxysms marked, but less severe than in the case just related. Two ʒ ss. doses, given at bedtime, gave him complete relief, which lasted all night. This was repeated a number of times, always with the same result.

Case VIII.—Male, 47. Bright's disease; bronchitis; pulmonary œdema with very great dyspnœa. Whisky and digitalis were given without any benefit. When quebracho was added, given in ʒ ss. doses every half-hour for two hours, marked improvement took place after the second or third dose, the improvement lasting five or six hours. As the patient was then growing worse, the quebracho was repeated as before, with a like result. In five or six hours more it was again repeated, with benefit. Cardiac stimulants were kept up throughout the whole time, so it is impossible to say exactly how much of the improvement was due to the quebracho. This patient is still in the hospital, and doing well.

In this connection I would remark that three cases were reported in the "Medical News and Abstract" for May, 1881, of the successful use of quebracho, by a distinguished member of the Therapeutical Society, Professor Austin Flint, Sr., in his service at Bellevue Hospital.

In the first of these cases, one of aneurism of the ascending arch of the aorta, cardiac hypertrophy, and great dyspnœa, iodide of potassium was given till symptoms of iodism appeared, without relief to the patient. ♏xxx fl. ext. quebracho were administered every three hours. After the second dose, complete relief of dyspnœa was experienced, the pulse fell from 100 to 86, and the respiration, which had been hitherto hastened, to its normal frequency. During the two weeks following, while he remained in the hospital, several recurrences of dyspnœa were as speedily relieved.

The second case, of asthma, emphysema, and bronchitis, for two years a gradually increasing dyspnœa, which now hardly permitted him any exercise. After twelve days in hospital he was discharged with this record: The constant dyspnœa which harassed the patient has almost disappeared under the continued administration of quebracho (♏xxx) thrice daily; appetite and strength much improved.

Third case; chronic nephritis, dyspnœa. Treatment for nephritis, though effective, did not relieve the dyspnœa; and ♏xl of quebracho (fl. ext.) were given at intervals of three hours. Abatement of the dyspnœa followed, and after a few days the patient was entirely relieved, and the dyspnœa did not return.

The reporter adds this:

"Note.—Quebracho has been tried by Dr. Flint in several cases of dyspnœa from phthisis and pneumonia, without avail. In one case of extreme dyspnœa from mitral regurgitation it was very efficacious."

Cases reported by Dr. J. F. Duffield, Presbyterian Hospital (service of Drs. Burrall and Castle):

Case I.—J. T., male, 29. Catarrhal phthisis, third stage. *March 20th.*—Dyspnœa excessive. Fl. ext. quebracho, ♏xl, given at intervals of one hour (three doses), without appreciable effect, either on pulse or respiration. *22d.*—Patient died.

Case II.—C. P., male, 28. Intermittent fever, quotidian; old pleurisy; and spasmodic dyspnœa (an opium-eater); ♏xl quebracho given during the attack. Respiration, at time, 32; fifteen minutes later, 36; one hour later, when second dose was given, respiration 34; fifteen minutes later, 38. Pulse also rose, but record lost.

Case III.—J. P., 60, male. Fatty heart; general œdema. Taking gr. $\frac{1}{20}$ strychniæ sulph. t. i. d.; ℥ss. inf. digitalis also. *June 10th.*—♏xxx fl. ext. quebracho given him at 11 A. M. Pulse 60, resp. 44. In 20 minutes pulse fell to 56, resp. 32. Dose repeated at 1 P. M., with pulse 46, resp. 36; twenty minutes later, pulse rose to 48, resp. unchanged. At 3.30 P. M., 30 minims more were given, with pulse 48, resp. 38. Fifteen minutes later pulse unchanged, resp. 36. *11th.*—♏xl were given at 11.45 A. M. Pulse 54, resp. 38. In fifteen minutes, pulse 52, resp. 36. At 2.40 P. M. medicine repeated, pulse 52, resp. 38; fifty minutes later, pulse 56, resp. 36.

Case IV.—L. G., 36, Ireland, seamstress; catarrhal phthisis, second stage; chronic bronchitis. Unable to take opiates. Treatment: stimulants, tonics, and cough-mixtures. Was put on fl. ext. quebracho, ♏xl every three hours, for twenty-four hours. All cough-mixtures, etc., stopped. It had the effect of lessening resp. 3 to 8 a minute, and rendering the breathing much easier for the whole period. Vomited the last dose.

Cases reported by Dr. George Bayles:

Case I.—German, aged 65. Asthma depending upon cardiac disease. Made one visit in April; the patient breathing with marked difficulty and great voluntary effort. Prescribed fl. ext. quebracho in ♏xx doses, in water, to be repeated hourly if necessary; was informed the following day that the paroxysm was entirely relieved after taking three doses at a little less than two-hour intervals. All previous attacks had never been of less than twelve hours' duration, and sometimes twenty-four.

Case II.—Young woman, plethoric, and a free eater. Frequent attacks of nervous dyspnœa, attended with hysterical symptoms. After a hearty dinner indigestion supervened, and alarming dyspnœa. ♏xx doses fl. ext. quebracho were ordered hourly till symptoms subsided. After four doses had been taken the patient was entirely relieved of all distressing respiratory symptoms. The completion of digestion may have had much to do with the relief experienced, though I am inclined to regard the quebracho as an important aid; for such prompt relief had never been obtained before under like circumstances.

Cases observed by Dr. A. H. Smith :

Case I.—Mrs. C., aged 65. Long-standing mitral regurgitation, with pulmonary œdema and hydrothorax; orthopnœa; respiration very rapid and catching; lips livid. Two doses ♏xl Squibb's fl. ext. quebracho were given without any noticeable relief. So much nausea was caused by the medicine that its use was abandoned. In this case digitalis had ceased to give relief.

Case II.—C. H., male, 36, patient at Presbyterian Hospital. This was a case of asthma, complicated with old pleuritic adhesions and with a recent attack of acute articular rheumatism. The dyspnœa came on in paroxysms of great severity. When the first dose of quebracho was given, March 10, 1881, the patient was sitting up in bed, his face purple, lips livid, breathing very labored, shoulders elevated with each inspiration. ♏xl of Squibb's fluid extract were given, and in fifteen minutes there was perfect relief, which lasted, however, only twenty minutes, when the difficult breathing returned. Another dose was then given, from which complete relief was obtained, lasting an hour. For the next twenty-four hours the attacks were less severe. On the following day, March 11th, the dyspnœa not being urgent, a dose of ♏xl was given, and the effect upon the respiration was observed. In fifteen minutes it had fallen from 27 to 20. At the time of these observations the patient was taking gr. x of salicylic acid, and ʒ ss. of dialysed iron, t. i. d. The dyspnœa not recurring, the quebracho was discontinued.

Of the thirty-two cases covered by this report, eleven were of spasmodic asthma, with or without emphysema and bronchitis. Of these, in nine cases the dyspnœa was notably relieved. In two cases of asthma associated with bronchitis no benefit resulted. One case of emphysema and bronchitis without asthma was relieved. One case of bronchitis with obesity was not relieved. Two cases of mitral insufficiency were not relieved. One case of mitral stenosis was not relieved. One case of hypertrophy with dilatation was not relieved. In two cases of cardiac disease (form not stated) the dyspnœa was relieved. In one case of fatty heart there was slight relief. Two cases of dyspnœa depending upon Bright's disease, in one of which pulmonary œdema is noted, were relieved. In one case of aortic aneurism the dyspnœa was relieved till near the close. In one case of tonsillitis the dyspnœa, partly nervous, was relieved.

In one case of cancer of the lung dyspnœa was relieved. In two cases of pneumonia it was relieved. One case of hysterical dyspnœa was relieved. In one case of catarrhal phthisis, second stage, the dyspnœa was relieved. In one case of catarrhal phthisis, third stage, it was not relieved. In one case of intermittent fever with old pleurisy, the patient being an opium-eater, the dyspnœa was increased. Thus, of the thirty-two cases of different diseases in which dyspnœa formed a prominent feature, this symptom was relieved to a greater or less extent in twenty-one cases; not relieved in ten cases; aggravated in one case. In some instances the treatment was not pushed far enough to give a decisive result. It is possible that the nausea observed in some cases might have been avoided by the use of smaller doses, and perhaps a favorable result obtained.

The fact that dyspnœa depending upon such a variety of causes may be relieved by quebracho points to the respiratory center as the seat of its action. Apparently it blunts the sense of want of air, and thus mitigates the suffering from a deficient supply. But this action is not necessarily only palliative. Exaggerated respiratory efforts are often in themselves an evil, not only on account of the muscular effort expended, but from the aspiration of blood into the thoracic viscera, which results especially when the dyspnœa is caused by narrowing of the air-passages rather than by solidification or compression of the lung. Hence in many cases an agent which will moderate the violence of the respiratory movements will not only lessen the distress of the sufferer, but will increase the chances of his recovery. That quebracho will often very promptly fulfill this indication there seems to be no room to doubt, while as yet there is no evidence that it is liable to produce unfavorable after-effects. The extremely disagreeable taste of the medicine and its tendency to produce nausea are, however, serious drawbacks to its use by the mouth. As yet, we have no record of its employment by the rectum. If the active principle shall be isolated, so that it can be used hypodermically, a great advantage will have been obtained.

NOTE.—A series of careful and most satisfactory tests of quebracho in dyspnœa, numbering more than thirty cases, have been made by Dr. George M. Tuttle, House Physician at the New York Hospital (service of Dr. W. H. Draper, a member of this Society). The results will doubtless be given to the profession at an early day.

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Editorial.

LACERATION OF THE CERVIX UTERI.

We are of those who believe that gynæcologists are not content that their branch of medicine should much longer maintain its present attitude—an attitude in which, to be sure, it can claim credit for the brilliant record of its major operations, but can put forward no adequate defense against the imputation that its lesser pathology and therapeutics are in a confused and most unsatisfactory state. This condition of things is not to be wondered at, for one may count on his fingers the years during which modern methods of study have been brought to bear upon gynæcology. None the less, however, is it a state of things under which scientific minds must chafe, and one that no efforts should be spared to put an end to. There is substantial evidence that this work has really been entered upon in earnest, and we know of no more valuable contribution to it than the recent review that has been undertaken of the subject of laceration of the cervix uteri, the chief features of which are embodied in Dr. Lee's paper and the discussion that followed its reading before the Medical Society of the County of New York, both of which are to be found in the present number of this journal.

Even if the outcome of this discussion were nothing more than the broad fact that the tendency on the part of our leading gynæcologists is to narrow the scope of uterine trachelorrhaphy rather than to extend it, it could yet be accounted a solid gain, for it would show the conservative ground taken by these gentlemen, and make it plain that they at least are not open to the criticism that attributes to gynæcologists a disposition to urge operative measures without due regard to their necessity. Indeed, in this matter, as in so many others, it is not so much that the leaders are reckless as that they are compelled to withstand a blind urging from behind. It is the old story—injudicious advocates damage a cause far more than its opponents can damage it. This is amply shown in Dr. Lee's paper. Men constantly send patients to specialists, not to get the benefit of their judgment, but for them to carry out a course of procedure determined on beforehand. We have even heard of a practitioner who sent a patient to New York to be operated upon for laceration of the cervix, and who, instead of hanging his head for shame when he found that she had been cured without an operation, actually showed anger, remarking of the remedial measures that were described to him that he could have done that himself! It is highly creditable to our leading gynæcologists that they not only strive to diffuse among their professional brethren the knowledge that should enable them to discriminate as to the propriety of operative measures, but also decline in individual cases, in which such a course requires some courage, to perform operations that they judge to be inexpedient or unnecessary.

But this is not all. Dr. Emmet has taken a decided step in advance by abandoning the theory that the evil effects of lateral laceration are due to eversion produced by the weight of the uterus pressing the two lips down against the pelvic floor and so spreading them apart. The fact that the pathological train of events that follows so regularly upon a severe laceration does not occur after methodical division of the cervix, even involving an equivalent amount of solution of continuity, negatives the theory at once; and this inference must long ago have forced itself upon Dr. Emmet's mind. It is none the less creditable to him, however, that he has chosen to submit the matter to a long course of experimental study before formally renouncing the view he first put forth. The mechanical theory of uterine pathology has been getting some hard blows of late, but never, we venture to say, such a home-thrust as this abandonment of the gravitation theory of eversion, and its replacement by a recognition of the importance of non-visceral inflammation and its sequelæ. The truth seems to be narrowed down to this: as a rule, laceration of the cervix is of no lasting pathogenetic significance, except in so far as it serves to keep alive the embers of an old peritoneal or cellular-tissue inflammatory process. In a certain proportion of cases proper treatment will cure the latter without any attention being paid to the laceration itself; when it fails there is good reason to look upon the laceration as the hindrance to success, and to remove it by the comparatively simple and harmless operation devised by Dr. Emmet. The occurrence of an outbreak of pelvic inflammation is reckoned among the possible sequelæ of this operation, although it seems well established that, with proper precautions, the liability to it is very small; but the quandary still remains, how many of the few such contretemps that do take place would not have occurred all the same if no operation had been performed—for every gynæcologist must have met with cases of laceration of the cervix, evidently demanding operative treatment, in which repeated recrudescences of inflammation postponed its performance indefinitely.

A question arises as to the part played by cicatricial tissue in giving rise to the reflex disturbances sometimes associated with cervical laceration. We do not refer to the difference of opinion elicited in the discussion of Dr. Lee's paper as to whether such reflex phenomena are brought about by the instrumentality of the sympathetic nerves, or by the intervention of the cerebro-spinal system, but to the fundamental question of whether cicatricial tissue is in any way chargeable with the results that have been mentioned. We are inclined to think that much observation will be required to settle the matter.

As regards the primary operation, i. e., the closure of lacerations by suture immediately after parturition, the indications for its performance have been laid down very precisely by Dr. Pallen. We should regard hæmorrhage uncontrollable by other means as the sole justification of the measure. Dr. Polk brought forward an aspect of the matter that we hope to see further investigated, namely, the causes and prevention of lacerations of the cervix. It is easy enough to impute such mishaps to errors on the part of the obstetrician, but it is quite another matter tô point out to him how he is to avoid them. It is evident that in this respect there is room for research worthy to rank with that of Bandl in regard to rupture of the uterus.

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Special Articles.

IS THERE A SPECIFIC URETHRITIS?*

By P. ALBERT MORROW, M. D.

By urethritis, or gonorrhœa, is understood an inflammation peculiar to certain mucous membranes, producing a discharge capable of exciting a similar inflammation when applied to other mucous surfaces susceptible to its action. Is this inflammation always the product of a specific virus, or may it originate from a variety of causes absolutely devoid of specificity?

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* Bell.—"Treatise on Gonorrhœa Virulenta and Lues Venerea," London, 1793.
Ricord.—"Lettres sur la Syphilis," Paris, 1863.
Rollet.—"Des Maladies Vénériennes," Paris, 1865.
Fournier.—"Dict. de Méd. et de Chir. Prat.," 1866, art. "Blennorrhagie."
Milton.—"On Gonorrhœa," London, 1876.
Auspitz.—"Vrtljschr. f. Dermat. u. Syph.," 1879, p. 1.
Bumstead and Taylor.—"On Venereal Diseases," Philadelphia, 1879.
Holmes's "System of Surgery" (Simon, art. "Inflammation"; Dixon, art. "Ophthalmia"; Henry Lee, art. "Gonorrhœa").
Jullien.—"Traité Pratique des Maladies Vénériennes," Paris, 1879.
De Luca.—"Giorn. Internaz. delle Sci. Med.," n. s., 1880; "Ann. de Dermat. et de Syphil.," ii, 2, 1881.
Keyes.—"On Venereal Diseases," New York, 1880.

The terms urethritis and gonorrhœa will be employed indifferently in this article. The latter, though etymologically incorrect when applied to a purulent or muco-purulent secretion, has the sanction of common usage; but the former is much to be preferred, as it more clearly conveys an idea of the seat and essential nature of the disease it is intended to express, and, moreover, it corresponds with the scientific terms used to characterize other inflammations, as cystitis, conjunctivitis, etc.

When all venereal diseases were by common consent included under the general term lues venerea, a doubt as to the specific nature of gonorrhœa could not exist. As is well known, gonorrhœa, chancroid, and syphilis were at one time all supposed to be due to a single cause, viz., the virus of syphilis. Hunter, who was a firm believer in the unity of the species and cause of all contagious diseases of the genital organs, says: "The matter of gonorrhœa will produce either gonorrhœa, a chancre, or the lues venerea; and the matter of a chancre will produce either gonorrhœa, a chancre, or the lues venerea." As defined by Judd, writing in 1834, "urethritis is an inflammation caused by the irritation of the syphilitic virus on the delicate mucous membrane lining the urinary canal or vagina." This conception of its origin and nature was but a reflection of the views which were almost universally entertained at that time.

A glance at the literature of this disease will show that a theory as to its nature containing certain elements of truth with a certain proportion of error was abandoned for one with a much larger admixture of error, and that it was not until our own time that its true nature was recognized and its proper place in the nosological category assigned it.

There is no question as to the antiquity of gonorrhœa; it is as old as human history. Most authorities concur in the opinion that it was doubtless this disease which was referred to by Moses in the fifteenth chapter of Leviticus. Unmistakable allusions were made to it by various Greek and Arabian physicians, who described its complications—orchitis, sympathetic bubo, etc. Even were there no historical data upon which to base a belief in its existence from the earliest ages, our knowledge of its nature and the conditions which give rise to it would render such an inference almost certain. Although at first confounded with spermatorrhœa, and afterward supposed to be due to ulcerations of the canal, its existence as a distinct disease had always been recognized. But with the irruption of syphilis into Europe, toward the close of the fifteenth century, its individuality was swallowed up in the greater importance of the new disease, its distinctive character being lost sight of and not again recognized until Bell, Hernandez, Ricord, and others pointed out the pathological features which separated it from syphilis and demonstrated its independent origin.

From the standpoint of our existing knowledge it seems almost incredible that gonorrhœa and syphilis, separated as they are by such broad and distinct lines of demarkation, should ever have been considered identical; but this great error reigned supreme for nearly three centuries, and was not challenged until Balfour, in 1767, raised the first formal protest against it. In 1793 Bell expressed his disbelief in the prevailing doctrine, and declared that gonorrhœa and syphilis arose " from different and specific contagions." In 1812 Hernandez, in a very able monograph detailing the results of his experiments with gonorrhœal matter, clearly demonstrated the non-identity of the two diseases. But it is to the genius and labors of Ricord that we owe the final and complete overthrow of the doctrine of the unity of all forms of venereal disease.

To briefly recapitulate.—Until toward the close of the fifteenth century gonorrhœa was described as a distinct disease, although erroneous ideas as to its nature were entertained. From that time until early in the nineteenth century it was generally regarded as a form of syphilis, but since Ricord gave the finishing stroke to the demolition of the theory of its syphilitic origin and identity it has been recognized as a special malady having its own individuality, constituting a distinct pathological entity.

Ricord went further; he not only insisted upon the non-syphilitic character of gonorrhœa, but he denied even its virulent origin, asserting that it might originate under the influence of any cause capable of exciting catarrhal inflammation of mucous membranes.

But, while all authorities are now unanimous upon the fact of its non-identity with syphilis, they are by no means in accord upon its etiology and nature. The question whether it depends for its origin, maintenance, and propagation upon a specific virus still divides medical opinion.

In France, where the doctrine of the simple nature of all urethral inflammations was first enunciated, Fournier, Langlebert, Jullien, and others have ranged themselves on the side of Ricord, while Diday, Guérin, Martin, Rollet, and others hold views in direct antagonism with this doctrine.

In England the spectacle is no less curious. Thompson, Berkeley Hill, Henry Lee, and other authorities believe in the multiple origin of gonorrhœa, while Milton, Lane, and others of equal prominence claim that a specific pus is the exclusive source of the disease.

In our own country we find that the same wide difference of view prevails. Van Buren, Keyes, Durkee, and others assert the virulent nature of gonorrhœa, while Bumstead, Otis, Gouley, and others deny its specific character.

Within the last year or so two treatises on venereal diseases have appeared in this country—one, by Bumstead and Taylor, reflecting the views of Ricord as to the simple character of gonorrhœal inflammation; the other, by Keyes, hotly contesting this view, and placing it among the virulent diseases.

The essential points of difference in views so directly antagonistic may be summarized thus: The *virulists* assert that gonorrhœa can alone generate gonorrhœa—that the matter by which it is communicated is as specific in its nature as the lymph of the cow-pox vesicle, and that the supply of infectious material is kept up in the same way, by propagation from individual to individual. The *non-virulists* claim that the determining cause of gonorrhœa is irritation, that contagion is only a mode of irritation, and that any irritative cause capable of provoking inflammation of mucous surfaces may give rise to a discharge as acute, as persistent, as contagious, "as gonorrhœal" as if it owed its origin to a virus the most unquestionable.

Examining into the arguments upon which these two schools base their beliefs, we perceive at a glance that they stand largely upon common ground. Both admit that gonorrhœa is the most venereal of all venereal diseases, and that in an immense majority of cases it has for its origin the venereal act. Both agree as to its symptoms, course, pathology, and treatment; but in considering its genesis and the essential nature of the inflammatory process, here arises the point of divergence.

While the partisans of the specific school admit that a urethritis may arise from a non-venereal source, and that, clinically, it is difficult, if not impossible, to differentiate a simple from a virulent urethritis, they insist that the etiological element of contagion gives the latter a distinct impress and stamps it as a specific disease. They divide inflammations of the urethra into two classes: 1. Virulent urethritis, severe in character, apt to be attended with complications, obstinate to cure, and *highly contagious.* 2. Simple urethritis, mild in character, not liable to complications, with a spontaneous tendency to cure, and *not contagious.*

Going back to the age of confusion in venereal, we find that a quite similar distinction was made. Even at that time forms of urethritis were recognized which were entirely independent of venereal origin, and obviously due to simple causes. These were classed under the general name of gonorrhœa simplex, in contradistinction to those imputed to the syphilitic virus and denominated gonorrhœa virulenta. The catalogue of causes capable of exciting discharges from the urethra, according to the writers of that day, was quite extensive. Fluor albus, the menstrual flux, excess in wine or venery, excessive or violent exercise, riding on horseback, jolting in a carriage, sitting on a cold stone, working in ditches, stimulating bougies, stone in the bladder, stricture, etc., were instanced as causes. Many discharges were found to be associated with constitutional disorders. Thus, Hunter speaks of gout and rheumatism attended with a discharge from the urethra. The well-known experiment of Swediaur (1782) of injecting solution of ammonia into his urethra, developing a violent inflammation, with copious puriform discharge which continued for six or seven weeks, demonstrated the capability of chemical irritants to excite a discharge identical with that of gonorrhœa.

Bell seems to have had quite a clear comprehension of these cases, and admits that a virulent could not be distinguished from a simple gonorrhœa either in symptoms, duration, or termination. He cites a case in which the application of powdered savine to a venereal wart situated deep within the urethra caused the mucous membrane to become inflamed through the whole length of it, producing a copious puriform discharge. The running had all the appearance of gonorrhœal matter, and continued for two or three weeks. He also declared that irritation from stone in the bladder might be propagated to the urethra and assume all the appearances of virulent gonorrhœa. "Stricture may also give rise to a discharge similar to that of virulent gonorrhœa, so as to deceive the best practitioners"; "it also occasions swelled testicle, sympathetic swellings in the groin," etc.

It would seem, then, from this hasty comparison, that the only difference between the *identists* of that day and the *virulists* of the present consists in the substitution of the hypothesis of a *specific pus* for that of the *syphilitic virus* in the causation of gonorrhœa, and that this is essentially the same view as that held by Bell and enunciated by him in 1793.

In order to state the position of the *virulists* as strongly as possible, we will quote from Keyes, Milton, and Rollet—all prominent partisans of this school.

"Gonorrhœa is a virulent disease; it has a period of incubation, runs a course of varied length, possesses its virulence to the very end, and is in the highest degree contagious. The intensely contagious quality of gonorrhœal pus has been demonstrated by experiment from urethra to urethra, by inoculation upon the conjunctiva. It can not be denied that pus from true gonorrhœa placed upon the orifice of the urethra of the male or the vagina of the female will light up intense inflammatory disturbance. On the other hand, pus of the most varied character (not gonorrhœal) may be placed upon the meatus of the male or poured along its canal without inflaming it. In cases of intense balanitis beneath a tight prepuce, the cavity of the foreskin is constantly filled with dense, creamy pus, and there is no urethritis. Chancroid situated within the urethra does not occasion gonorrhœa. Pus from pyelitis may be voided thick as cream through the urethra, but does not occasion inflammation of the canal. In the female, pus from the kidneys, bladder, or uterus, pus from chancre, chancroid, and mucous patches—none of these kinds of pus produce gonorrhœa in the female. The male may cohabit with the female whose vagina contains more or less pus from the uterus, and remain well. A man with purulent discharge may cohabit with a woman and she remain sound; not so in either case if there be even a very little of gonorrhœa present. A gleet after a gonorrhœa nearly well may give gonorrhœa to the woman; a small amount of lurking gonorrhœa in the vagina may easily poison the male. A man who is debilitated, or full of liquor, and over-exerts himself sexually, may get urethritis from contact with irritating discharges in the vagina. When he offers himself in exposure to the poison of true gonorrhœa he is certain to become poisoned without the coöperation of any of the adjuvants above mentioned. Simple exposure is enough; the result is certain and quite evident."

Milton, who is the author of the most voluminous monograph upon gonorrhœa ever published, and one of the most radical of the virulists, calls attention to "a practical distinction to be drawn between discharges produced by gonorrhœal matter and those induced by non-specific causes, viz., while the former tend to run into obstinate gleet, the latter pass away spontaneously." Again: "Simple urethritis makes its appearance immediately after connection (twelve to fourteen hours), whereas urethritis from specific animal poison has a period of incubation of from four to fourteen days." "Simple urethritis is not accompanied with chordee, orchitis, and certain constitutional symptoms, as rheumatism, ophthalmia," etc.

Different views as to the nature of the contagious principle divide the partisans of the "virus" theory. The great majority believe, with Diday and Rollet, that the contagion depends upon some peculiar quality of gonorrhœal pus—a pus containing a principle not well defined or demonstrable, but which is the exclusive source of gonorrhœa.

M. Thiry (of Brussels) taught that contagion was due to a special virus, the *granular virus*, which could determine upon the urethral mucous membrane a pathological element, granulation, and that there could be no contagion without these granulations.

M. Jousseaume, in 1862, developed a theory that the essential element of contagion in true gonorrhœa was a parasitic growth, to which he gave the name *genitalia*. Previous to this M. Donné had announced the discovery of the presence of several animal and vegetable parasites in gonorrhœal pus.

The parasitic theory may be dismissed from consideration as unworthy of acceptance. The occasional presence of parasites is accidental, and not peculiar to gonorrhœal pus. As regards the existence of a granular virus, it has not been proven. Auspitz, who has devoted special attention to the study of pathological states of the urethra as revealed by endoscopic examination, concludes that "granulations are not the specific seal of virulent venereal urethritis."

The *non-virulists* assert that the gonorrhœal process may be the result of any irritation whatever, provided that it be carried to a sufficient degree of intensity. While contagion plays a prominent *rôle* as an etiological factor, yet it is only a mode of irritation—rendered much more active and certain, no doubt, by the excitant properties of the pus which is the essential agent. But an inflammation produced by the pus of the most characteristic gonorrhœa can not be distinguished either in course, complications, or infectious quality from an inflammation produced by a multiplicity of other causes. Without attempting to enumerate these causes, it may be said that they may all be classed under the following divisions: 1. Irritation of the urethra from various vaginal discharges, such as that of leucorrhœa, the menstrual fluid, the secretions from ulcerations and granulations of the os uteri, malignant and other diseases of the womb, chemical irritants, strong injections, etc. 2. Traumatic causes, as catheterism, the passage of a calculus, masturbation, etc. 3. Adjuvant and predisposing causes, as errors in diet or drink, muscular fatigue, over-indulgence in sexual pleasures, stricture, damaged urethra from antecedent inflammation; individual predisposition from constitutional causes, as the scrofulous, gouty, and rheumatic diatheses, etc.; use of certain drugs, as cantharides, or certain articles of food, as asparagus, etc.

Ricord, the father of this school, says that catarrhal muco-pus is the most efficient irritant in determining urethral inflammation; but, also, that men may contract gonorrhœa from intercourse with women in whom the most minute examination with the speculum fails to find anything abnormal. His remarks upon this point may be quoted as follows: "When we investigate with the greatest care the determining causes of the most characteristic gonorrhœas, we are forced to admit that the gonorrhœal virus is absent in the majority of cases. There is nothing more common than to find that women who have occasioned the most intense, the most persistent gonorrhœas, accompanied with the most characteristic gonorrhœal complications, were only affected with uterine catarrh, sometimes hardly purulent. Quite often the menstrual flux appears to have been the sole cause of the disease. In a great number of cases we can discover nothing—unless, perhaps, errors in diet, excess in sexual intercourse, the use of certain drinks or of certain articles of food. Hence the frequent belief of patients, which is often correct, that they have contracted their clap from a perfectly healthy woman. Upon this point I am assuredly familiar with all the sources of error, and I have the pretention to say that no one is more guarded than myself against the various forms of deceit which beset the path of the observer; yet I confidently maintain the following proposition: *Women frequently give gonorrhœa without having it themselves.* When one studies gonorrhœa without prejudice, without preconceived notions, he is forced to admit that it often originates from causes that give rise to inflammation of other mucous membranes." Fournier says: "The result of my investigations convinces me that the opinion of Ricord is the only one that can be accepted as conforming to the facts of daily observation. It seems to me, however, that it falls below the truth. Ricord says '*frequently* women give gonorrhœa without having it.' In my opinion he should have said *most frequently.* For one gonorrhœa that results from contagion, there are three at least where contagion (in the proper sense of the word) does not play any *rôle.* According to my observation, a man is more often responsible for his gonorrhœa than the woman from whom he seems to have taken it."

Fournier furnishes two classes of facts which seem to give statistical confirmation to these assertions. The first relates to the relative frequency of gonorrhœa in the two sexes; the other, to a comparison of the number of cases of this disease contracted from public prostitutes with the largely disproportionate number originating from other women. The records of the Midi Hospital disclose the fact that three fifths of all the men were affected with gonorrhœa, while the register of the hospital devoted to females shows that the percentage of cases of gonorrhœa was very small; and, compared with the number of cases of uterine catarrh, there was an enormous disproportion (only one to thirteen).

Again, among 387 cases of gonorrhœa contracted from various women, in which the origin was definitely traced, only twelve cases were contracted from public prostitutes, a class which is the most prolific source of chancre and chancroid. The necessary conclusion from these and other clinical observations is that gonorrhœa is acquired much less frequently from contagion than from the irritation of uterine catarrh, coupled with excessive intercourse, under conditions of excitement which are most often absent in commerce with prostitutes.

Having thus stated somewhat *in extenso* the articles of faith of the two schools, and their essential points of difference, let us now proceed to analyze the arguments upon which they are based, and by an examination into all the facts, clinical and pathological, bearing upon the question at issue endeavor to arrive at a conclusion as to which has the best claims to be accepted as sound scientific doctrine. In the first place, it is to be observed that the theory of a specific virus rests mainly upon the following proposition: Gonorrhœal pus is intensely contagious, and, conversely, pus from a non-gonorrhœal source is not contagious. As to the first part of this proposition, there is no need of discussion. Experiment, clinical facts, all unite in furnishing positive proof that gonorrhœal pus will generate gonorrhœa, either by direct or by mediate contagion. There is no need that the contact of the pus be of long duration, nor even that it take place during the period of venereal excitement; no necessity that there be a breach of surface for the introduction of the morbid material. Simple contact of the pus with the mucous membrane is sufficient to excite inflammation in many cases. But, this concession made to the partisans of a specific virus, it must be added that this contagion is not nearly so invariable and absolutely certain as has been assumed. It is subordinate to certain conditions which preside over the communication of other diseases undoubtedly specific, as scarlatina, small-pox, etc. Our observation of these diseases teaches us that there is nothing constant in contagion; that it depends for its development and effect upon certain auxiliary causes or influences, not thoroughly understood, but which may be classed as constituting individual predisposition. It is well known that the intensity and duration of the disease modify its contagious quality. There are some gonorrhœas which are not readily transmissible at any stage, and others which lose their infectious property after a certain time. Milton, the chief apostle of this school, says: "It does not follow that every gonorrhœal discharge, in its first or last stage, must necessarily convey infection. Some men repeatedly court risk, and escape again and again, and, if they do become infected, the gonorrhœa dies out of itself, or yields to such simple remedies as a few injections of cold water, failing, however often the attack may be repeated, to bring on any of the more severe results.. So does the susceptibility vary in women." Many examples illustrating disparity in receptive power might be instanced, as where several men have had intercourse with the same woman at short intervals, and, while some have become infected, the rest have escaped. We therefore conclude that contagion from gonorrhœal pus is by no means so definite and certain as has been pretended.

As to the converse of the proposition—that pus from a non-gonorrhœal source is not contagious—it has been disproved by numerous experiments. Vetch transferred muco-pus from Egyptian ophthalmia to the urethral mucous membrane of an individual, and developed gonorrhœa thirty-six hours later. M. Guyomar introduced pus from granular purulent ophthalmia into his own urethra. At the end of the third day gonorrhœa declared itself, ran a severe course, and only yielded after three weeks' energetic treatment. Otis introduced pus from acute ophthalmia into the urethra of an adult, with the effect of producing a gonorrhœa which continued four or five weeks, attended by the ordinary complications of œdema, chordee, etc. M. Pauli de Landau introduced muco-pus by means of a pledget of lint from the eye of a child into the vagina of a prostitute perfectly healthy, which was allowed to remain half an hour. At the end of three days gonorrhœa declared itself, which extended to the uterus. Other experiments show that urethral inflammations are produced by pus from the most varied sources—pus from a common abscess, from vulvitis, from infantile leucorrhœa (caused by worms), etc.

Confronted with these facts, the *virulists* take refuge behind the assertion that these are cases of simple inflammation of the urethra, the discharge from which is not contagious, and, therefore, not gonorrhœal. This explanation involves a nice distinction, which many fail to appreciate; for the contagious character of the pus is abundantly proven by its already having excited an inflammation in a previously healthy mucous membrane, and why may not this same property be continued in another and still another remove from its origin? But this objection, if it be one, is silenced by the results of further experimentation. Pauli de Landau introduced muco-pus from ophthalmia neonatorum into the urethra of a perfectly healthy man, thirty-six years old. The third day a discharge from the urethra commenced, which he communicated to his wife, notwithstanding the warning of the physician. Dr. A. Hiller inoculated his own wife with the muco-purulent secretion brought on in the urethra by a mechanical irritant, and succeeded in reproducing the discharge. Otis reports the case of a gentleman whose meatus he had cut, and to whom he had given a bougie to insert daily, in order to prevent recontraction. The unskillful use of the instrument developed a urethritis unusually severe and obstinate, extending to the deeper portions of the urethra, and from the discharge of which the patient infected his wife.

But why multiply instances? The literature of venereal abounds in well-authenticated cases showing that a urethritis possessing contagious properties may be the product of pus from various sources.

Another distinction urged between virulent and simple urethritis is that, while "the former has a tendency to run into obstinate gleet, the latter passes away spontaneously." Upon this point an authority representing each school may be quoted. Bumstead says: "Some of the most obstinate cases of urethritis I have ever met with have been of leucorrhœal origin, and have terminated in gleet of many months' duration." Diday says that cases of urethritis which originate in the menstrual fluid constitute a distinct class, characterized by their greater persistency and obstinacy to treatment than cases of gonorrhœa from contagion.

As to the distinction based upon certain complications, claimed to occur only in virulent urethritis, it may be said that these complications are comparatively rare; rheumatism, for example, is met with but seldom, even in the most characteristic gonorrhœas. The evolution of articular symptoms in these cases seems to depend upon individual predisposition rather than upon any pathogenetic quality of gonorrhœal pus. The accident of localization of the disease in the urethra seems to be the determining cause of the joint complication, as Ricord long ago pointed out that women whose gonorrhœa was not located in the urethra were exempt. It is well known that urethral fever, as well as arthritis, may be caused by catheterism. Barwell, in his now classic work on "Diseases of the Joints," says: "With regard to that malady which has been most usually observed as a complication of gonorrhœa, it will be well to remember that its connection with that discharge is not constant, but that it has also been known to follow the use of catheters or bougies. Hence, as its name, gonorrhœal rheumatism, is in both adjective and noun misleading, I propose henceforth to term it urethral synovitis."

Proceeding now to an examination of the arguments of the *non-virulists*, we encounter the statement that the muco-pus of uterine catarrh frequently engenders urethritis. This the virulists admit, but they say urethritis is not gonorrhœa. Right here we touch the pivotal point of the discussion; the whole matter hinges upon the determination of the question as to whether there is any well-founded distinction between urethritis and gonorrhœa. If it produces an infectious discharge, it not only resembles gonorrhœa in its most essential characteristics, but is clearly identical with it, so that if it be proved even in a single instance that a leucorrhœal secretion from a woman, virgin of all antecedent contamination, had excited a urethritis in the male attended with a contagious discharge, the partisans of the specific doctrine must give up the cause for lost. For that would prove the *spontaneity* of the disease, which is irreconcilably opposed to, and necessarily precludes, its *specificity*. Now, such proofs, so far from being unique, are common—of daily occurrence. Their authenticity is vouched for by men of undoubted ability and honesty—men quite competent to eliminate sources of error in tracing a causal connection, and whose reputation for veracity is unimpeachable. Such authorities as Ricord, Fournier, Jullien, Profeta, and others, state most unequivocally that the abuse of sexual pleasures with women affected with uterine catarrh occupies the front rank among the causes of gonorrhœa.

But, the virulists demand, if leucorrhœa be the fruitful source of gonorrhœa in the male, how is it that so many husbands escape? Most married women suffer at times from leucorrhœa, and, as M. Guérin says, "if leucorrhœal discharges were contagious, men would be forced to renounce marriage in large cities, where the hygienic conditions develop leucorrhœa in most young women."

An explanation of the comparative immunity of husbands from leucorrhœal discharges is found in Ricord's theory of "acclimation." It is well known that a woman may prove innocuous to her husband, and yet infect her lover on whom she has bestowed unaccustomed favors. These apparently contradictory facts are explained by what Trousseau terms *accoutumance*—i. e., that any tissue by frequent exposure to the same irritation becomes insensible to it. Habituation confers an immunity against the action of any morbific agent, just as in the exhibition of drugs the system becomes by their constant repetition insusceptible to their action. This is seen in the gradually decreasing effect of the same dose of morphine when regularly used; or, to make the analogy more complete, the habitual employment of a drastic cathartic deadens the sensibility of the intestinal mucous membrane—or, rather, exhausts its susceptibility, until the drug becomes inert. Another explanation may be found in the conditions under which intercourse is usually carried on among married people. Greater precautions as to cleanliness, etc., are observed, and sexual excess is not so apt to be committed as in extra-conjugal adventures. Hasty repetitions especially dispose the parts to inflammation. As Diday says, "a leucorrhœa which would have remained inoffensive after a single coitus takes on, by redoubled excitement, irritant properties, and furnishes then a contagious fluid"; and he impressively adds: "The man who has been the author of this recrudescence usually becomes its first victim."

However much one may question the truth of the proverb that "repetition is the thief of enjoyment" when applied to the venereal act, yet it can not be doubted that in a pathogenetic point of view it steals away the power of resistance, while it "opens a breach for ruin's wasteful entrance." Not only does it give the leucorrhœal discharge a potentiality which it did not possess before, but it heightens the susceptibility of the male. The intense hyperæmia from prolonged erethism makes the mucous membrane much more porous and permeable, while the enervation which follows frequently repeated coitus robs it of its protective power, and renders it susceptible to influences to which in a state of repose it might have been subjected with impunity.

But we do not have to depend alone upon clinical observation for proof that a leucorrhœal discharge, primarily innocuous, may be intensified into an acrid, irritating agent capable of exciting inflammation. Direct experiment confirms most amply and completely the facts of clinical experience. The experiments of De Luca, showing that the clear, transparent liquid which escapes from the cervix becomes contagious when from any cause whatever it becomes charged with purulent globules, have so direct a bearing upon the question at issue that we will quote them in a condensed form. I.—Secretion of uterine catarrh, very rich in pus globules, injected into urethra of the patient, developed urethritis. II.—Uterine secretion from same subject, had become scanty, transparent, viscid, rich in mucus cells, injected into urethra of prostitute; result, negative. III.—Sero-epithelial secretion of prostitute with uterine catarrh in process of cure, injected into urethra; result, negative. IV.—Uterine catarrh, same subject; discharge had been changed and intensified by the passage into the cervical cavity of a sound dipped in ammonia; secretion, which had become more abundant and charged with pus globules, introduced into urethra of a prostitute, excited urethritis absolutely similar in symptoms and course to venereal urethritis. V.—Collected sputa of a patient suffering from bronchitis and malaria. Pus corpuscles were abundant, with vibratile epithelial cells; introduced into urethra, developed discharge, abundant and purulent. VI.—Catarrhal secretion artificially excited in preceding subject, carried into urethra of a female free from all discharge, developed urethritis absolutely similar to that of venereal origin. VII.—Good, laudable pus from small abscess of the eyebrow, transferred to urethra of prostitute. Two days afterward developed sub-acute urethral catarrh, absolutely similar to gonorrhœal discharge. VIII.—Secretion from urethra of subject of preceding experiment, introduced into urethra of another prostitute. Positive results, development of discharge clinically identical with urethritis. If these experiments and others of like character are to be accepted as true, and there seems to be no reason for questioning their authenticity, it is necessary to renounce for ever the idea of the specificity of gonorrhœal pus.

It would seem, then, that the position of the virulists rests upon a wrong interpretation of pathological facts—viz., the assumption that because the fact of contagion proves the presence of a poison it must of necessity be a *specific* poison, one incapable of being produced by common inflammation. Upon this point the remarks of Simon, than whom no higher authority is recognized, deserve careful attention. He says: "Waiving for the moment any discussion as to what constitutes the undoubted 'specificity' of the first two named inflammations (cow-pox and chancre), it may on good grounds be asked with regard to gonorrhœa whether it be anything more than a common inflammation of the affected membrane—an inflammation which perhaps first originated, and may with infinite frequency re-originate, from local accidents of dirt and lust; and which, having thus originated, shows a more communicable character than some other catarrhal inflammations—than common cold in the head, for instance—only because genitals come into inoculative contact more frequently than eyes and noses. In the writer's opinion, there is ample reason to question the popular impression that only 'specific' inflammations are communicable; much reason for suspecting it, on the contrary, to be a generic and essential property of inflammation that its actions (or some of them) are always in their kind to some extent contagious."

Independently of these arguments based upon clinical and experimental facts, there are inferences to be drawn from a study of the analogies existing between inflammations of the urethral and those of the conjunctival mucous membrane. As these analogies relate not only to similarity of structure (both being lined with epithelium of the pavement variety), but extend to etiology, pathological processes, and treatment, they render such conclusions perfectly legitimate. All ophthalmologists agree that the various forms of conjunctivitis—common purulent ophthalmia, gonorrhœal and Egyptian ophthalmia, and ophthalmia neonatorum—resemble each other very closely, so that they can not be differentiated in many cases. Dr. Dixon says: "Gonorrhœal ophthalmia is essentially the same in character as purulent ophthalmia. I know of no symptom by which they can positively be distinguished." Now, taking ophthalmia neonatorum, which is recognized as the typical form of purulent inflammation of the conjunctiva, we find that, while it is most generally caused by the introduction of the gonorrhœal or leucorrhœal secretion between the eyelids of the infant during parturition, yet there are many cases in which no contagion can be traced. The discharge may not even be purulent, many cases having been caused by an ordinary vaginal catarrh. Cases now and then occur in which the mothers have had no discharge from the vagina, the outbreak of the disease having been referred to exposure to a very bright light, sudden draughts of air, impure atmosphere, etc.

Mark the perfect parallelism which exists between urethritis and ophthalmia neonatorum from an etiological point of view. Both usually originate from direct contagion, both may originate from simple vaginal catarrh, both occasionally originate when no vaginal discharge can be found. When we come to experimental proof we find that the product of the two inflammations has identical properties. Pus from urethritis, applied to the eye, will produce ophthalmia; pus from the conjunctiva, applied to the urethra, will produce urethritis.

The experiments made with gonorrhœal pus for the cure of pannus leave no possible doubt as to the interchangeable and identical nature of urethral and conjunctival inflammations. The experiments of Jaeger, Piringer, Van Roosbroeck, Warlomont, Desmarres, Richard, and others have proved conclusively that the same effect is produced upon the eye from whatever kind of purulent ophthalmia the matter of inoculation is taken—that the effect is still the same whether, instead of taking the muco-pus from the eye, it is taken from the urethra. In Dr. Piringer's series of 87 cases, the matter was taken from ophthalmia neonatorum in 29 cases, from gonorrhœal ophthalmia in 11 cases, from the urethra of a boy 3½ years old in 2 cases, from acute ophthalmia (not gonorrhœal) in 40 cases, from palpebral ophthalmia in 2 cases, from chronic ophthalmia in 4 cases. Van Roosbroeck employed indifferently pus from gonorrhœal, from infantile, and from purulent ophthalmia. The only difference observed in the effects of the matter from these various sources depended upon the activity of the inflammatory process which produced it.

The identity of the cause and nature of inflammations of the urethra and conjunctiva being thus demonstrated, we conclude, with Simon: "Obviously there is no sense, except one involving a *petitio principii*, in which the word specific can be applied to these communicable conjunctival inflammations, and, if they are not specific, but common inflammations, where is the reason for believing that the communicability of gonorrhœa constitutes it a specific disease?"

From this presentation of the case it would appear that the position of the *virulists* rests altogether upon pure hypothesis, and is wholly untenable, while all the facts—experimental, clinical, and pathological—are overwhelmingly in favor of the non-specific character of gonorrhœal inflammation. Further, it may be urged that when we apply the gauge of specificity to gonorrhœa it corresponds to none of the conditions of an undoubtedly specific inflammation. In the first place, no artificial production of any disease belonging to this group is possible; a specific disease is the product alone of a specific poison. We have seen that gonorrhœa, on the contrary, may be due to a variety of causes—contagious, irritant (mechanical or chemical), diathetic, etc.

Again, in all specific diseases there is between the time of infection and the first expression of the disease a period of incubation. No incubation, properly so called, characterizes gonorrhœa—no more than there is between the chilling of the feet and the appearance of a coryza, as Ricord pointed out, or between the action of the exciting cause of bronchitis or pneumonia and the appearance of the suppurative symptoms. A drop of this same gonorrhœal pus, which may require two or three days to excite suppuration of the urethra, will develop such effect in a few hours when applied to the conjunctiva, showing that the so-called incubation depends not upon the quality of the exciting cause, but upon the susceptibility of the mucous membrane. Another distinctive peculiarity of this group is that a single attack of the disease confers almost complete security from another attack—a peculiarity precisely the opposite of what is observed of gonorrhœa. One attack seems to establish a predisposition to a second, and the more numerous the attacks the more easily the disease is contracted anew, showing its analogy with other catarrhal inflammations.

Again, the morbid poison of a specific inflammation, once in action, continues until the textural predisposition to its special stimulus is exhausted. The patient is incapable of regenerating the poison or of being affected by it when exposed anew. Both of these conditions are negatived in the clinical history of gonorrhœa. What physician in active practice has not frequently met with cases in which the following class of facts is observed? A man contracts gonorrhœa from an undoubted gonorrhœal source. After the acute symptoms have subsided there comes a period of decline, and the gonorrhœa degenerates into a gleet. This mucous discharge, hardly sufficient to agglutinate the lips of the urethra, may continue indefinitely, for weeks or months; but, as it no longer contains pus, the active principle of contagion, it is not communicable and, therefore, *not specific.* But, under the influence of liberal potations of beer, for example, or of stimulating articles of food, as asparagus, or of strong sexual excitement, without gratification it may be, the discharge becomes developed into a thick, creamy pus, highly contagious and, of course, *specific.* Now, what had become of this principle of specificity? It had vanished from the urethral discharge; from what hiding-place has it thus suddenly emerged? Was it concealed in the glass of beer, did it lie coiled up in the asparagus, did it lurk in the erotic excitement? To such lame and impotent conclusions must a belief in the specificity of gonorrhœa lead us. Certainly none of the undoubtedly specific diseases furnish a parallel clinical history. Could we well conceive of the contagium of scarlatina or small-pox lying dormant in the system for months, capable of being awakened and revivified into dangerous activity under the influence of any cause, either of external or of internal origin?

Finally, specific inflammation determines special pathological changes and demands special treatment. As we have seen, identical pathological processes are met with in urethritis from various causes, and the most radical of virulists treat all urethral inflammations alike.

In this connection it may be asked, if the determination of the question of the specificity of urethritis has no practical bearing upon treatment, wherefore this long and labored discussion as to the existence or non-existence of a specific virus? To this it may be answered that, independent of any value the question may have from a scientific standpoint, it assumes a considerable importance from a social point of view. It embraces many delicate social problems which may affect the peace, happiness, and honor of families. In pronouncing upon the origin and nature of a urethral discharge the physician may cast grave suspicions upon the virtue of the chastest of wives; he may unjustly accuse of moral delinquency the most faithful of husbands. The assumption that every contagious discharge from the genitals carries with it demonstrative proofs of guilt—that it could have originated only from an impure coitus—involves a heavy responsibility for the partisans of the specific virus. But, aside from its moral aspects, the question has medico-legal relations of the greatest importance. Divorces have been sought for and obtained upon accusations of infidelity which the slender support of the existence of a urethral discharge alone sustained. Innocent persons have been convicted of criminal assaults upon children upon the testimony of physicians who did not know that it was impossible to differentiate positively between gonorrhœal inflammation and vulvar inflammation from simple causes. If space served, many other relations with legal medicine, no less important, might be referred to.

Reviews and Literary Notes.

The Structural Anatomy of the Female Pelvic Floor. By David Berry Hart, M. D., F. R. C. P. E., Assistant to the Professor of Midwifery in the University of Edinburgh, etc. Being a thesis for graduation at the University of Edinburgh, for which a gold medal and the Syme fellowship were awarded. Edinburgh: Maclachlin & Stewart, 1880.

About two years ago we first saw a specimen of Dr. Hart's anatomical work, in the shape of an article in the "Edinburgh Medical Journal," and we were struck at the time with the originality of research and cleverness of deduction manifested by the author, and his evident determination to get at the truth in regard to the architecture, if we may so express it, of the female pelvic structures. Having attempted some work in the same field ourselves, we knew its difficulties and its immense importance, and we felt a glow of satisfaction that it had been entered upon by an investigator who seemed so fitted for the task. The work now before us is a graduation thesis, made up, as the author states, by collecting and amplifying several papers of his that had previously been published in the journal alluded to. We will say at the outset that it confirms the estimate we first formed of Dr. Hart, and we trust that it may prove an incentive to others to aid in the labor, most of which is still before us, of mastering the design that underlies the structure of these parts.

Expressed in few words, the central idea of Dr. Hart's conception of the female pelvic floor seems to be this: it consists of two parts, one of which, the "sacral segment," is made up of the powerful muscular wall that closes the outlet of the pelvis, in effect prolonging the posterior bony wall of the pelvis forward almost to the pubic arch, and including the "perineal body"; the other, the "pubic segment," is a composite structure, embracing the bladder and the anterior wall of the vagina. These two segments overlap each other like valves. The former is attached posteriorly, but movable anteriorly, opening down as if it were hinged behind. The latter is attached anteriorly, but free behind, opening up as if hinged in front. Between these two segments—the pubic rising in front, and the sacral being pushed down behind—the uterus expels the fœtus. At other times, and under normal conditions, a practically unbroken floor is presented by the overlapping of these two segments; but it is upon the sacral segment that almost the entire work falls of sustaining the viscera. The pubic segment is weak in comparison, and will yield under the most ordinary strain, unless supported by its more powerful associate. The perinæum is of some importance, but, being only a part of the great sacral segment, its *rôle* is quite secondary, although, being from its situation exposed to bear the first brunt of any extraordinary intra-abdominal pressure, it is specially strengthened by fibrous tissue. When the sacral segment is so strained, or weakened, or injured as to yield, the pubic segment, being unable to cope alone with the pressure from above, rolls out and down, and we then have in succession prolapse of the anterior vaginal wall and prolapsus uteri, or, as Dr. Hart believes it more proper to call them, "sacro-pubic hernia."

We may have misapprehended some of the points, but we think we have given Dr. Hart's idea substantially. In the main we admire it, but we would suggest some modification. No doubt the muscular floor of the pelvis is capable of all the author imputes to it, but we do not think it is often called upon to exert that capacity, for the mechanism situated above it seems to us to be equal to the task of supporting the viscera under ordinary circumstances. We would prolong the "pubic segment" backward, and make it include the uterus and the utero-sacral ligaments. It would then stretch continuously from the anterior to the posterior wall of the pelvis. Certainly it can not be denied that this continuity of structure does actually exist. We do not think that this view is invalidated by the facility with which the uterus can be drawn down to the vulva in many instances, as Dr. Hart seems to think. There are many structures of the body that unquestionably perform a supporting function of no trifling order; and yet how many of them yield marvelously under a sudden strain, and then as suddenly regain their tone! We would say, then, that the fœtus pierced the structure in question, instead of turning it up in front. This is by no means incompatible with an ascent of that portion of it situated in front of the fœtus in its transit, as Dr. Hart's observations seem to show to be the case. For that matter, too, the "sacral segment" is really pierced by the fœtus, for practically that structure is attached in front as well as behind. A median antero-posterior section does not tell the whole story.

Speaking of the clinical features of prolapsus uteri, the author remarks that as the uterus descends it becomes more and more retroverted. This is not always the case. We have seen complete procidentia with anteversion. Indeed, Schütz's drawing, essentially reproduced by Dr. Hart, and alluded to by him as admirably illustrating the description he has given, shows a procident uterus bolt upright. The author denies *in toto* that supra-vaginal elongation of the cervix takes any part in causing prolapsus.

In most of the drawings the empty bladder appears collapsed from above downward. Dr. Hart thinks this is usually the case, but that normally it is collapsed from before backward. We are inclined to think that the usual condition (correctly figured by the author) is also the normal one.

Dr. Hart's explanation of the way in which the Hodge pessary acts is, to our mind, the correct one, namely, by carrying the posterior wall of the vagina backward and thus dragging the cervix back. There are several observers who hold this view, but, unfortunately, it has never been upheld with much energy, and consequently it has scarcely engaged the attention of the profession in general.

The author displays much ingenuity and rare discrimination in applying his deductions to matters of practice. As instances, we would refer to his remarks on specula and pessaries, on the situation of the os uteri internum during the second stage of labor, and on the bearing of the ascent of the bladder during labor upon laparo-elytrotomy and Cæsarean hysterectomy. We must repeat our earnest commendation of the work as a whole, and we may be allowed to express the wish that Dr. Hart may continue his contributions to this fundamental department of gynæcological knowledge. The publishers deserve credit for the beautiful appearance of the book.

The Relations of the Abdominal and Pelvic Organs in the Female. Illustrated by a full-sized chromo-lithograph of the section of a cadaver frozen in the genu-pectoral position, and by a series of woodcuts. By Professor Alexander Russell Simpson and Dr. David Berry Hart. Edinburgh and London: W. & A. K. Johnston, 1881.

A colored plate, of life size, showing a median antero-posterior section of an adult female cadaver frozen in the genu-pectoral posture, is the most noticeable feature of this work. It is exceedingly well done, and must certainly possess whatever value can possibly attach to such drawings. To us, however, the great interest of the work lies in the text, which chiefly deals with the clinical bearings of the knee-chest posture. The authors believe that the practical uses of the posture in question are more limited than many gynæcologists imagine. For the insertion of pessaries, unless in prolapsus uteri, they do not think it advisable to place the patient in this posture, and they are unable to see what good can ensue from making a patient assume it every night, and distend the vagina by passing Campbell's tube, except in cases of congested ovaries. Nor do they believe that this posture, followed by opening of the vaginal orifice, is a means of treatment that is followed by full replacement of the retroverted uterus, unless in a small percentage of cases. Complete replacement can be obtained only when rectal distension, or pressure on the fundus, or manipulation of the cervix with a volsella is superadded. The best procedure, they suggest, is, probably, not to open the vagina when the patient is in this posture, but to press downward and to the left on the fundus with the middle finger in the rectum, at the same time using the index finger as in the bimanual method. We believe these conclusions to be sound, and it would be interesting to trace the reasoning that leads to them, but we should be doing the authors an injustice were we to attempt a summary of their investigations. We prefer, therefore, to urge the work upon the attention of our readers as it stands. The student of gynæcology can find no more profitable reading than is presented in its pages.

Experimental Researches on some Points relating to the Normal Temperature of the Head. By J. S. Lombard, M. D., formerly Assistant Professor of Physiology in Harvard University. I. On some Points relating to the Temperature of the Head. II. Effect of Voluntary Muscular Contractions. III. Influence of the Temperature of the Air. London: H. K. Lewis, 1881. Pp. 39–45–16.

Professor Lombard is already well known for his experiments on body temperature, and anything coming from his hands upon this subject will be welcomed by physiologists. The work before us, although unpretending in style and modest in size, bears out the reputation of the author as a careful and patient worker. It consists of three distinct portions. The first contains an analysis of some six thousand observations, made with the view of determining whether the degree of absolute temperature of the head influences the preponderance in temperature of one side over the other. The results of the experiments are given in full in tabular form, and the figures thus obtained are compared in every possible way. Although this comparison shows that no relation can be established, such as the author had imagined to exist, his results are not the less valuable on that account. To the scientific man a negative conclusion, if firmly grounded on fact, is almost as important as a certainly determined positive result; it is far more valuable than a positive result based on insecure evidence.

In the second part, the author, after repeating the experiments of Amidon, decides that the latter was mistaken in associating certain muscular movements with a rise of temperature in definite parts of the head. In this opinion, we may remark, he is sustained by the experiments of Bert and François-Franck; although Dr. Amidon, in a recent series of observations, thinks that he has obviated the objections raised by these physiologists. It seems to us, however, that there can be no question as to the accuracy of Lombard's determinations.

The last portion of the book considers the relation between the temperature of the head and that of the external air, quantities which are found to vary in the same sense, although by no means in the same proportion. The author thinks that the permanent change of atmospheric temperature caused by the alternation of the seasons has greater influence upon the body temperature than a transient change occurring in the course of a single day.

We have given so full a summary of the contents of this little book because it is with the results that the general reader has to do, and in this case the results seem to be deserving of especial confidence.

A Treatise on the Materia Medica and Therapeutics of the Skin. By Henry G. Piffard, M. D., Professor of Dermatology, Medical Department of the University of the City of New York, etc. New York: William Wood & Co., 1881. Pp. 351. [Wood's Library of Standard Medical Authors.]

This volume really includes two separate works, namely, a dictionary of drugs in so far as concerns their action upon the skin, and a condensed treatise on dermatology. These titles, it is true, are not laid down in the book, but it is divided into two parts, called, respectively, "Materia Medica" and "Therapeutics"; but we are confident that a perusal of the work will make it plain that we have described its scope accurately.

As to the first part of the book, which we have characterized as a dictionary, its plan is peculiar, displaying Professor Piffard's well-known originality and ingenuity in a striking manner. Peculiar as it is, however, it is so lucidly explained in the introduction, and appears so particularly well adapted for the purpose the author had in view, that the reader will find no difficulty in following it. He will doubtless be struck at first with the great array of drugs that Dr. Piffard has felt justified in cataloguing as having been credited with producing some effect or other on the skin. In regard to most of them, the data are chiefly of the nature of references to literature, and are mainly valuable as memoranda. In the case of the more important drugs, however, explanatory and critical remarks are freely introduced, and of their tenor we can speak only in terms of the highest praise.

Concerning the second part of the work, more than half of the volume, it is a condensed and thoroughly practical account of the various affections of the skin, special prominence being given to the matter of treatment. A formulary is appended.

We can not close this brief notice of a most meritorious work without expressing our sense of the great service which the author has performed in preparing it.

Aids to Diagnosis. Part I—Semeiology. By J. Milner Fothergill, M. R. C. P., Lond., etc. Pp. 75. Part II—Physical. By J. C. Thorowgood, M. D., M. R. C. P. Pp. 61. New York: G. P. Putnam's Sons, 1881. [Student's Aid Series.]

1. Dr. Fothergill's little book is interesting, and full of practical points for the student. Among the topics considered are: Attitude, Physi-

ognomy, Hue of Skin, Expressions, Eyes, Gums, Teeth, Ears, Neck, Abdomen, Hands, Nails, Manners, Tongue, Pulse, Respiration, Cough, Sputa, Hæmoptysis, Urine, and Temperature, and the book closes with points to be noticed "on visiting a patient at home." The author, in his preface, "craves allowances for defects and shortcomings," as this "subject has not been systematically handled before."

2. Dr. Thorowgood's is a small manual on Physical Diagnosis, and will be found useful to the student preparing for examination.

Manual of the Physical Diagnosis of Diseases of the Heart, including the Use of the Sphygmograph and Cardiograph. By Arthur Ernest Sansom, M. D., Lond., F. R. C. P., Assistant Physician to the London Hospital, etc. Third edition. Philadelphia: Presley Blakiston, 1881. Pp. xii–300. [Price, $2.]

The addition of the section on the Use of the Sphygmograph and Cardiograph in this edition very much increases the value of a work which we regard as the best manual of the diagnosis of diseases of the heart in our language. The subject matter is well arranged, and the author's style is clear and concise. Dr. Sansom promises a companion work on the *treatment* of heart disease.

Books and Pamphlets Received.—A Practical Treatise on Impotence, Sterility, and Allied Disorders of the Male Sexual Organs. By Samuel W. Gross, A. M., M. D., Lecturer on Venereal and Genito-urinary Diseases in the Jefferson Medical College, etc. With sixteen illustrations. Philadelphia: Henry C. Lea's Son & Co., 1881. Pp. viii–17 to 174, inclusive. ═══ Atlas of Skin Diseases. By Louis A. Duhring, M. D., Professor of Skin Diseases in the Hospital of the University of Pennsylvania, etc. Part IX. Philadelphia: J. B. Lippincott & Co., 1881. [Price, $2.50.] ═══ Rheumatism: its Nature, its Pathology, and its Successful Treatment. By T. J. Maclagan, M. D. London: Pickering & Co., 1881. Pp. xii–333. ═══ Antiseptic Surgery. The Principles, Modes of Application, and Results of the Lister Dressing. By Dr. Just Lucas-Championnière, Surgeon to the Hôpital Tenon, etc. Translated from the second and completely revised edition, with the special sanction of the author, and edited by Frederic Henry Gerrish, A. M., M. D., Surgeon to the Maine General Hospital, etc. Portland: Loring, Short, and Harmon, 1881. Pp. 239. [Price, $2.25.] ═══ Clinical Lectures on the Diseases of Old Age. By J. M. Charcot, M. D., Professor in the Faculty of Medicine of Paris, etc. Translated by Leigh H. Hunt, B. Sc., M. D., etc. With additional lectures by Alfred L. Loomis, M. D., Professor of Pathology and Practical Medicine in the Medical Department of the University of the City of New York, etc. New York: William Wood & Co., 1881. Pp. xv–280. [Wood's Library of Standard Medical Authors.] ═══ Coulson on the Diseases of the Bladder and Prostate Gland. Sixth edition. Revised by Walter J. Coulson, F. R. C. S., Surgeon to St. Peter's Hospital for Stone, etc. New York: William Wood & Co., 1881. Pp. xxiii–393. [Wood's Library of Standard Medical Authors.] ═══ Trichinæ, etc. By John Phin, editor of the "American

Journal of Microscopy." ═══ The Remedial Properties of the Hot Springs, Ark., etc. By Charles H. Lothrop, M. D., Lyons, Iowa. ═══ Proceedings of the Academy of Natural Sciences of Philadelphia. Part I.—Jan.–May, 1881. ═══ Beiträge zur gerichtlichen Medicin. Von Prof. Dr. Hermann Friedberg in Breslau. [Reprint.] ═══ La Psicopatia Religiosa di Alia. Pel Dott. Alfonso Giordano. [Reprint.] ═══ The Functional and Morphological Relations of the Cerebellum. By E. C. Spitzka, M. D. [Reprint.] ═══ Are all Anæsthetics Dangerous which contain Chlorine, Bromine, or Iodine? By Edward T. Reichert, M. D. [Reprint.] ═══ May Iodide of Potassium excite Bright's Disease? By I. Edmondson Atkinson, M. D. [Reprint.] ═══ Hip Injuries, etc. By De F. Willard, M. D. [Reprint.] ═══ Hip-Joint Disease, etc. By De Forest Willard, M. D., and E. O. Shakespeare, M. D. [Reprint.] ═══ The Question of Axillary or Ischiatic Support in the Treatment of Joint Diseases of the Lower Extremity. By A. B. Judson, M. D. [Reprint.] ═══ What Shall We Do with the Inebriate? By T. D. Crothers, M. D. [Reprint.] ═══ Genital Irritation. By C. Fayette Taylor, M. D. [Reprint.] ═══ Report of the Trial of James Thomas Dejarnette for Homicide, with an Appendix. By Eugene Grissom, M. D. [Reprint.] ═══ Stenosis of the Larynx, etc. By W. H. Daly, M. D. [Reprint.] ═══ Tubercular Laryngitis, or Laryngeal Phthisis. By C. J. Lundy, M. D. [Reprint.] ═══ On "Kerion Celsi," a variety of Tinea Tonsurans. By I. Edmondson Atkinson, M. D. [Reprint.] ═══ Distal Compression applied in a case of Inguinal Aneurism with a Successful Result. By Theodore R. Varick, M. D. [Reprint.] ═══ Statistics of Amputations performed at St. Francis Hospital, Jersey City, N. J., from 1871 to 1881. By Theodore R. Varick, M. D. [Reprint.] ═══ Quarterly Report of Medical Officers, United States Army, etc., July 1, 1881. ═══ Minutes of the Twenty-sixth Annual Meeting of the Kentucky State Medical Society. ═══ Ninth Annual Report of the Board of Health of the City of Boston. ═══ Third Annual Report of the State Board of Health of the State of Rhode Island. ═══ University of Bishop's College. Eleventh Annual Announcement of the Faculty of Medicine, Montreal. ═══ Announcement of the Albany College of Pharmacy. Department of Pharmacy of Union University. ═══ Annual Announcement of the Physio-Medical College of Indiana, ninth regular session.

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Clinical Reports.

BOSTON LYING-IN HOSPITAL.

Reported by G. G. Hayward, M. D.

(Service of DR. W. L. RICHARDSON.)

THREE SUCCESSIVE DELIVERIES IN A CASE OF NARROWED PELVIS.

First Confinement.—This case seems to present many interesting facts worthy of note as we follow the same patient through her various confinements, all of which took place in the Boston Lying-in Hospital. The patient has been three times married and three times pregnant. Her first confinement took place September 14, 1873 (service of Henry Tuck, M. D.), when she was twenty-six years of age. There was nothing abnormal or remarkable about the labor except that it was a very tedious one of three days' duration, in which she was delivered of a male child weighing seven pounds. The child was very much asphyxiated, and the cord was looped around its neck. It lived only eleven hours. The mother made a very fair recovery, however, in spite of threatening septic symptoms. A high temperature prevailed at first, and on the second day the lochia became very offensive, and the tongue dry and coated. On the fifth day the milk came. Vaginal injections of a two-per-cent. solution of carbolic acid were given three times a day during the earlier part of the convalescence. Intra-uterine injections were not used in the hospital at that time. For a record of the temperature, see the table. The patient was discharged, well, on the fourteenth day.

Seoond Confinement.—The second confinement occurred June 26, 1875. After four days' severe labor, the patient was delivered by the high forceps operation by Dr. W. L. Richardson. The position being an occipito-posterior one (R. O. P.), and only partial rotation having occurred, it was with the greatest difficulty that the forceps could be applied. The left blade went on readily, but considerable difficulty was experienced with the right, as the head was placed nearly transversely above the brim of the pelvis and receded whenever an attempt was made to apply the blade. Even after the instrument was locked, extraction was difficult. The right arm was born with the head, and the cord was around the neck. The child was stillborn, a male, weighing seven and a half pounds.

The placenta was adherent, and it was necessary to introduce the hand into the uterus to remove it. Considerable hæmorrhage followed, which was, however, controlled by ice-water injections and ergot. The recovery, this time, was very slow, owing to septic influence. On the fourth day the lochia became scanty and offensive, and there was considerable abdominal tenderness. Poultices were applied. The milk also came at this time, and on the fifth day the breasts became very hard and tender. On the sixth day the lochia became more offensive, and considerable tympanites existed, with abdominal tenderness, and afterward nausea and vomiting. Poultices and vaginal injections (a two-per-cent. carbolic-acid solution) were used. On the ninth day diarrhœa commenced, and lasted four days. After this, steady improvement was noticed. The patient was discharged on the eighteenth day. For the temperature record, see the table.

Third Confinement.—The patient, now thirty-three years of age, entered the hospital April 29, 1881, at 8 p. m., the labor pains being strong; palpation showed the breech in the fundus, with the back to the right. The fœtal heart sounds were 136, heard below and to the left. The abdomen was very large and pendulous, with anteversion of the uterus. *Per vaginam*, the vagina was found normal; the os uteri dilated to a diameter of an inch, the anterior lip thickened. The membranes had ruptured spontaneously, and the head was presenting. The pubic arch was narrow. The urine contained a trace of albumen.

30th.—11.20 a. m., patient up and about. Pains very strong, but of no avail. Os 1·5 inches in diameter. Chloral was given three times, in fifteen-grain doses, during the night. Ether also was tried, without any appreciable result.

May 1st.—11.29 a. m., a careful examination showed that the antero-posterior diameter of the pelvic brim was decidedly narrowed, and that the child's head was very large. No progress. Considering the history of the previous confinements, the marked deformity of the pelvis, the large size of the child, etc., Dr. Richardson thought it best to deliver at once. Accordingly, the patient was etherized, and version was very easily performed, the right foot being brought down first. The half-breech appeared at the vulva, and the left foot was then reached, and by slight rotation and traction was swept over the abdomen and freed. The arms were next freed, the perineal arm being the first one extracted. Rotation, traction, etc., failed to free the head, and the forceps likewise failed. There was found not only great narrowing of the superior strait, but a narrowed pubic arch. The head, although large, was well in the axis of the pelvis, but above it; the ears could be felt. The cord had ceased pulsating. Craniotomy was accordingly decided upon, and the head was opened just behind the left mastoid process, which was the only point that could be reached. The child was then (11.48 a. m.) easily extracted with the cranioclast, and proved to be a male, weighing nine pounds.

The placenta was everywhere adherent, and the uterus was with great difficulty emptied with the hand. A considerable portion of the membranes was removed in small shreds. Persistent hæmorrhage ensued, which was finally controlled by the use of carbolized ice-water injections, a constant current being kept up for fifteen minutes. After this a large number of clots and shreds were expelled. Ergot was given at intervals as the patient could swallow. The uterus finally contracted fairly. The perinæum was torn to the extent of an inch. Three stitches were taken with carbolized catgut. The pulse, which was 120 at first, then soon came down to 100, and afterward to 96 a minute. The patient made a rapid recovery without a single drawback. As a precautionary measure, intra-uterine injections of a two-per-cent. solution of carbolic acid were given, at a temperature of 120° Fahr., night and morning, beginning the evening of confinement. Only once was there detected the slightest odor from the lochia. On the tenth day there was a slight rise of temperature caused by the large flow of milk, the breasts becoming hard and painful. These were rubbed with camphorated oil and supported by a bandage. The patient sat up on the thirteenth day, and was discharged, well, on the twentieth, with the advice that if she again became pregnant she should apply at the hospital earlier, with a view to the induction of labor at a time when there was a chance for the child to be born alive.

The adherence of the placenta in two successive pregnancies, followed in one by puerperal septicæmia, and in the other by a normal convalescence, seemed to favor the use of intra-uterine antiseptic injections in cases where septic poisoning is likely to occur. The increasing size of the children in each successive pregnancy is worthy of notice, although a fact known to be the rule in most cases. The following table shows well the clinical record of the temperature and pulse during the three deliveries:

	UNAIDED DELIVERY. First confinement.	HIGH-FORCEPS OPERATION. Second confinement.	CRANIOTOMY. Third confinement.
	Fahr.	Fahr.	Fahr.
1st day	A. M., pulse 92, temp. 103·5	A. M., pulse 102, temp. 100·1	
	P. M., " 92, " 101·7	P. M., " 108, " 100·6	P. M., pulse 80, temp. 99·9
2d "	A. M., " 88, " 101·0	A. M., " 116, " 103·8	A. M., " 94, " 99·4
	P. M., " 88, " 102·0	P. M., " 144, " 105·3	P. M., " 92, " 100·6
3d "	A. M., " 88, " 100·5	A. M., " 124, " 103·1	A. M., " 94, " 100·0
	P. M., " 80, " 101·2	P. M., " 114, " 104·0	P. M., " 105, " 102·4
4th "	A. M., " 80, " 100·5	A. M., " 120, " 103·8	A. M., " 87, " 99·4
	P. M., " 88, " 102·7	P. M., " 116, " 101·9	P. M., " 96, " 101·6
5th "	A. M., " 112, " 102·2	A. M., " 116, " 101·5	A. M., " 96, " 99·2
	P. M., " 104, " 102·0	P. M., " 112, " 102·5	P. M., " 106, " 101·6
6th "	A. M., " 88, " 100·5	A. M., " 120, " 101·5	A. M., " 96, " 99·8
	P. M., " 104, " 101·2	P. M., " 120, " 101·0	P. M., " 87, " 101·2
7th "	A. M., " 88, " 99·5	A. M., " 112, " 101·1	A. M., " 87, " 98·7
	P. M., " 84, " 100·0	P. M., " 120, " 100·9	P. M., " 84, " 100·0
8th "	A. M., " 96, " 93·7	A. M., " 120, " 101·0	A. M., " 96, " 99·2
	P. M., " 80, " 100·0	P. M., " 120, " 102·3	P. M., " 81, " 99·7
9th "	A. M., " 92, " 99·5	A. M., " 104, " 101·7	A. M., " 90, " 99·6
	P. M., " 88, " 101·5	P. M., " 116, " 101·7	P. M., " 90, " 100·6
10th "	A. M., " 84, " 101·2	A. M., " 120, " 102·2	A. M., " 99, " 102·7
	P. M., " 76, " 99·5	P. M., " 112, " 101·6	P. M., " 102, " 103·1
11th "	A. M., sat up................	A. M., " 112, " 102·0	A. M., " 87, " 99·7
	....	P. M., " 108, " 101·9	P. M., " 87, " 101·7
12th "	....	A. M., " 88, " 101·4	A. M., " 96, " 99·3
	....	P. M., " 100, " 100·4	P. M., " 84, " 99·5
13th "	....	A. M., " 120, " 102·8	A. M., " 72, " 98·6
	....	P. M., " 118, " 103·7	Sat up.
14th "	Discharged, well...........	A. M., " 84, " 100·4	
	Child (7 lbs., male) lived 11 hours....................	P. M., " 116, " 104·2	
15th "	....	A. M., " 116, " 102·5	
	....	P. M., " 108, " 103·1	
16th "	....	A. M., " 108, " 98·4	
	....	P. M., " 100, " 100·1	
17th "	....	A. M., " 88, " 96·8	
	....	P. M., " 80, " 97·6	
18th "	....	Discharged, well...........	
	....	Child (7½ lbs., male) dead...	
19th "			
20th "	....	....	Discharged, well.
	....	....	Child (9 lbs., male) dead.

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Proceedings of Societies.

MEDICAL SOCIETY OF THE COUNTY OF NEW YORK.

A STATED meeting was held May 23, 1881, Dr. A. E. M. PURDY, President, in the chair.

THE PROPER LIMITATIONS OF EMMET'S OPERATION FOR LACERATION OF THE CERVIX UTERI.—In the discussion of Dr. LEE's paper (published in this number of the "Journal"), Dr. T. A. EMMET said that the profession should feel greatly indebted to Dr. Lee for his timely paper upon this subject. The operation had been done many times when it should not have been, and its proper limitations should be pointed out. He thought it might safely be stated that a laceration of the cervix uteri which had healed did not require an operation unless it produced positive symptoms. It was a question whether any woman who ever gave birth to a child escaped a greater or less lesion of the cervix; certainly all lacerations confined to the cervix did not require treatment. But, if the laceration extended into the connective tissue of the pelvis and along the vaginal wall, more or less pelvic inflammation would certainly follow; when cellulitis did not occur, the lesion usually healed up and produced no after-trouble. The bad effects, in such cases, he felt satisfied, arose from a lingering, persistent cellulitis. The English critic, referred to by Dr. Lee, was unjust, for a divided cervix seldom needed to be closed. That the lateral operation had been done too often in the past would be granted, also that the practice had been founded on false principles. This had been recognized, and the operation had long ceased to be generally performed. He (Dr. Emmet) had been consistent, however, for, in the paper referred to,* he protested against the lateral operation, and there stated that he had never operated in this manner more than some six times; and he could now add, after an interval of eleven years, that he had not repeated it. He quoted from his paper: "My objections to the lateral operation, in connection with the after-effects as an exciting cause of disease, are due to the fact that if gaping of the flaps occurs a tendency exists to a rolling out of the lining membrane of the canal. An erosion extending into the canal is soon established, which will recur as often as healed, with the result in time that the whole organ becomes hypertrophied. This source of irritation is due to the fact that whenever the female is on her feet the flaps become separated, from pressure on the posterior wall of the vagina. The everted lips in due time become softened and flattened down so as to lose all appearance of ever having been in contact. I have seen this condition presenting the appearance of an enormous cervix over two inches in diameter, with the whole organ enlarged and every attempt at treatment proving a failure until the true condition was appreciated. I have frequently observed the same effect following lateral laceration of the neck as a result of parturition, and to some extent where but one side had been involved. No such tendency to gaping occurs when the neck has been divided or lacerated in the antero-posterior diameter, for the surfaces are kept well together by pressure of the vaginal walls. In fact, it is seldom, when the accident occurs in this direction during childbirth, unless complicated by a vesico-vaginal fistula as a source of irritation, that the surfaces do not rapidly unite." He thought, at the time of writing that article, that the erosion and the rolling out of the lips of the laceration were due to the increased weight of the body of the uterus pressing and chafing the neck upon the posterior wall of the vagina; but careful observation during some years past had led him to believe that the condition was due directly to the product or remains of some old inflammation in the connective tissue of the pelvis, and generally in one or both broad ligaments, by which the circulation to and from the uterus was obstructed. This would cause the parts to roll out and the erosion to form. He had found this thickening always present to a greater or less degree. His study of the condition had convinced him that the operation should not be done until the parts had been brought into the best condition, for it could not be determined when the operation was necessary until this had been done. He had found that, in the absence of cicatricial tissue, by relieving the pelvic cellulitis and the inflamed condition of the cervix, he had occasion to resort to surgical means in about one case in ten in which he would formerly have operated. A relapse of the cellulitis, and of the eroded condition of the cervix, was little likely to occur unless the laceration involved the vaginal wall. The object in closing the laceration was to preserve what had been gained by treatment. It was to prevent a return of the erosion and the pelvic inflammation. He quoted further from the same paper: "I consider a successful termination of the treatment of uterine disease to be just in proportion to the amount of induration remaining afterward; for it is impossible for the uterus to perform its function properly if the cervix is left to a great degree a mass of cicatricial tissue, and sterility must invariably exist. Moreover, this condition, whether the result of disease overlooked, or from local treatment, is certainly an exciting cause of irritation to the nervous system, so that, indirectly, the nutritive functions become impaired, and tuberculous deposit is frequently a consequence." The presence of induration of the uterine and vaginal tissues caused reflex phenomena, as neuralgias, a disturbance of the functions of nutrition, and secondarily other diseases, tuberculosis, etc. No treatment was successful short of a removal of the induration; or the woman must continue to suffer from reflex disturbances, anæmia, etc., until the menopause, when nutrition again asserted itself. Before the speaker's attention had been drawn to this condition, and before he had recognized its effect, the nitrate of silver, and other caustics, were quite extensively employed in almost every uterine affection, and sometimes even as a prophylactic, twenty years ago, we might say. More women suffered from neuralgia then than now. Dr. Sims practiced amputation of the indurated cervix before this time, and a remarkable improvement in nutrition would afterward take place in a few weeks; but that procedure had this disadvantage, that it allowed the uterus to become retroverted, and thus cause a great deal of disturbance. The speaker stated that he found it was only necessary to shave off the thinnest amount of the cicatrized tissue, and then cover the denuded surface, as did Dr. Sims in his operation, with vaginal tissue. This effected the same results, the relief of neuralgias, disturbance of nutrition, etc.; but how he did not know until some years later; and while it was true that his explanation was not yet accepted by some, no one of observation could deny the clinical fact that this remarkable result did follow the removal of cicatricial tissue from the cervix. The cicatricial tissue was to be recognized by the sense of touch. Sometimes touch caused the patient pain, as the author of the paper had said. When a patient was very anæmic, and suffering greatly from neuralgia, he wasted little time in preparatory treatment for the operation; and as soon as the cellulitis was removed he proceeded to close up the lesion. The number of reflex symptoms which the condition produced was remarkable, for no portion of the body was exempt, nor any organ protected, from functional disturbance. He had operated upon a woman six weeks ago, in whom the lesion was not very large; there was no particular gaping of the wound, there was no discharge, but the patient had suffered for two years from severe colicky pains after each meal, so that she was fast becoming a regular opium-eater. He told her that he could discover no cause for her symptom, except considerable hardening in the angle of the laceration, and that, if she were willing, he would operate, more as a matter of experiment than with any particular hope of giving her relief. From the hour of the operation until to-day, six weeks after the operation, she had been entirely relieved. He had known the operation to relieve sleeplessness, various neuralgias, especially of the face, and, above all, innutrition, or an anæmic state. He could only explain the fact as follows: In the erectile tissue covering the cervix there were fibers of the sympathetic system; this system of nerves presided over the organs of generation, as well as over nutrition. We might therefore infer that a source of irritation would be established were fibers of the sympathetic involved in this dense tissue, and that from this close connection nutrition would naturally suffer. The evil effects upon nutrition did disappear after the menopause, and observation taught us that at this time nature attempted, by absorption, to remove the cicatricial tissue from about the cervix, which might long have existed there. If reflex disturbances had previously existed, and had disappeared as nutrition improved with the absorption of this tissue, the inference was a natural one as to cause and effect. Cicatricial tissue was seldom found in the neck of the uterus, and, as a rule, not in the vagina, after the menopause, although it might have been extensive during menstrual life. In conclusion, he would say: Let the cellulitis be first relieved, and then, if the symptoms have not disappeared, operate; but in many cases there would then remain no indications for the operation, and it should not be done. If cicatricial tissue still existed, but produced no disturbance, the patient might be let alone, but close watch should be kept lest symptoms subsequently developed; and, if so, the operation should be done, so as to effect a permanent cure. He refused to operate upon a woman four years ago, in whom there was a laceration, with cicatricial tissue in the angle of the wound, but which had produced no symptoms; six months ago she was suddenly seized with neuralgic pains in the face, whereupon he operated and gave relief. Many of the after-symptoms were not due immediately to the laceration, he thought, but to a cellulitis, which had persisted from the time of its occurrence at labor, having been caused by blood poisoning originating in the wound; and, by removing the cellulitis, the symptoms were often relieved, so that the operation was not afterward called for. In nearly every case which would call for the operation it could be discovered that, just after labor, there were some symptoms, such as puerperal fever, inability to nurse the child, etc., which pointed to absorption of poison from the open wound, and leading to pelvic inflammation, which persisted and prevented the wound from healing. The obstetrician should watch for every indication of the lesion, and make frequent injections to keep the parts clean, and then healing of the wound without a thickened and hardened tissue would be more likely to take place. It was remarkable how much nature would do to heal such injuries if the parts were only kept clean. He had seen at least two cases of vesico-vaginal fistula, into which he could pass his finger, heal up within a month after their occurrence, which took place at labor, simply because the edges were kept clean. How much more could be expected from such treatment of a laceration of the cervix! In case of hæmorrhage, the wound should, of course, be closed immediately; the operation, if done just after labor, would cause little shock. In such cases the perinæum also was usually ruptured; it should be sewed up at the same time.

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* "Surgery of the Cervix," read before the Medical Society of the County of New York, February 8, 1869, and published in "Am. Jour. of Obstet.," Feb., 1869.

Dr. M. A. **Pallen** stated that the first time he performed what was known as Emmet's operation for laceration of the cervix was in 1868, not knowing at that time that it had ever been done by anybody else. He afterward learned that Dr. Emmet had performed the operation several times, and to him belonged the credit of originating it. He had seen it done by but one other person, namely, Dr. Henry Goldthwaite, whom he assisted in its performance two years ago. The author of the paper had alluded to him (Dr. Pallen) as the first to perform the operation immediately after the occurrence of the lesion. That was in 1869, an account of which he gave in a paper written in 1872, and published in the "Richmond and Louisville Medical Journal" in 1874. In that case hæmorrhage occurred after delivery, which he recognized as due to laceration of the cervix. He failed to check it by a tampon, and about fourteen or sixteen hours afterward he placed the woman in the left lateral semi-prone posture, introduced a Sims's speculum, and sewed up the laceration with silver-wire sutures. The hæmorrhage ceased, and the woman rose from the lying-in couch well, the cervix being as if no laceration had occurred. He had since performed the "immediate" operation several times, and had, since 1869, published and taught to students the propriety of the operation immediately after the accident. The speaker also alluded to a paper of his, published in the "Transactions of the American Medical Association," 1867, in which he stated that no operation should ever be performed upon the cervix uteri as long as there were any traces of pelvic cellulitis. Dr. Emmet also had distinctly stated, in his work, that irrigation with hot water should be made, that the woman should be kept in the prone position, and all means taken to remove every trace of cellulitis before performing the operation. He must differ from Dr. Emmet, however, with regard to delay until symptoms developed. It was a general rule in surgery that all fractures, of whatever tissue, skin, bone, muscle, etc., should be rectified at once, if not to relieve present trouble, to avoid it in the future. Had Dr. Emmet performed the operation immediately upon the patient in whom facial neuralgia, etc., developed three or four years afterward, such subsequent sufferings would have been avoided. The speaker had had no occasion to regret having done it in any case, though there were cases in which he regretted not having performed it. He had the honor to read a paper on this subject before the British Medical Association at Cambridge, last year, only an abstract of which was published; and, as he had lost the original manuscript, he was unable to publish it in an American journal. He would take the liberty to refer to some statements contained in that paper with regard to the etiology of fracture of the cervix uteri (for laceration was a fracture). He wrote in 1868, and again in 1874, that this accident occurred most frequently as a result of too rapid labor; that the head was driven, or dragged by instruments, with force through the cervix, which resulted in laceration. He stated that when this accident occurred there was also likely to be laceration of the perinæum, for the head impinged upon this body suddenly (not giving it time to rise and fall, and gradually expand, as in healthy labor), and was driven through it. Subsequent and more careful observation had convinced him that the majority of cases occurred in slow and tedious labors, in which the forceps, if applied at all, was applied too late—applied after general congestion and tumefaction of the cervical tissues had taken place, the uterus having lost the greater part, if not all, muscular power to make an effort at expulsion. When the conditions calling for instrumental interference were recognized, the cervix should at once be dilated as fast as possible with the hydrostatic dilator, and the forceps applied, before circumvascular effusion and a congested condition of the tissues took place. Laceration of the cervix was, of course, anticipated in cases of deformity of the pelvis. In general, laceration of the cervix should be suspected when there was no lesion of the labia, perinæum, or vagina, to account for the presence of hæmorrhage; and, if it could not be discovered by the touch, the patient should be placed in the left lateral semi-prone position, and examined with the speculum; and then, the laceration being evident, it should be sewed up at once, just as a laceration of any other part of the body, from which hæmorrhage was taking place, should be sewed up at once. If it were delayed, as was often the case, with the hope that it would heal of itself, it was altogether likely that union would not take place, and the patient would be in danger of surgical fever (the result of absorption of blood poison from the open, torn vessels) and of pelvic cellulitis and phlebitis. The parts were so benumbed after labor that the operation caused scarcely any shock. It checked hæmorrhage, and prevented the possible absorption of septic material and the occurrence of those reflex and other troubles which so seriously affected the health and comfort of the patient. He had insisted for years upon what Dr. Emmet also had pointed out, viz., the necessity of keeping the parts perfectly clean by injections. Formerly he preferred a solution of permanganate of potassium, but now used thymolized carbolic water. If the proper instruments were not at hand with which to sew up the laceration, it might become necessary to tampon the vagina to check hæmorrhage, and this was the only case in which the tampon was justifiable in post-partum hæmorrhage. If it were resorted to, it should not be done carelessly, and with any material whatever that might be convenient; the patient should be placed in the left lateral position, Sims's speculum should be introduced, through which cotton should be packed in carefully and smoothly, and allowed to remain about six days. The urine should be withdrawn by the catheter frequently. After the fifth or sixth day the bleeding vessels would have become closed, and the tampon should then be removed. Pelvic cellulitis and phlebitis were to be expected when the tampon was resorted to. If a recent or old laceration were not sewed up, it might become the seat of epitheliomatous degeneration. The operation was almost invariably successful. In some instances the tissues were so denuded and the sutures so introduced that the cervical canal was left too small. In the case of one patient upon whom he operated, the nurse afterward separated the united surfaces, and profuse hæmorrhage ensued, which was controlled, and a second operation was performed, which was successful. Dr. Emmet assisted him. Dr. Lee and Dr. Emmet met with a similar accident shortly afterward. He had already incidentally referred to the dangers of the operation, which, he now repeated, were, if the patient were in fair health, and had no pelvic cellulitis, very few; the laceration was cured in nineteen out of twenty, or ninety-nine out of a hundred cases, with relief from the symptoms which it had previously caused.

Dr. P. F. Mundé said he was surprised when he heard the title of Dr. Lee's paper. So much had been written upon the subject of laceration of the cervix within the past few years that one would hardly suppose anything further was called for; certain points in the paper, however, showed that it was appropriate at this time. The operation had been performed many hundreds and even thousands of times—often with propriety, and often, doubtless, with impropriety. A certain gentleman in the West had performed it in one hundred and ten cases without any preparatory treatment, with successful results in all but five. He could only say that he must have been very lucky in his results, and, he thought, rather careless as to his indications. Another gentleman in the West did not sew up the laceration at all; he simply pared the surfaces, and slipped a rubber ring over the cervix, to retain them in apposition and allow them to heal. An Eastern gentleman said cervices were cut open by some gynæcologists only to give an opportunity to others to sew them up. Facts showed that there was a difference of opinion among even our best men concerning this subject, and that many well-informed practitioners did not understand it perfectly. An intelligent physician sent a woman to him who, he supposed, was suffering from granular erosion of the os. On examination, he discovered a laceration of the cervix in the third degree. Her physician had mistaken the condition of the everted mucous membrane for granular erosion of the os. Three and a half years ago he had made accurate notes of the condition of seven hundred women who had borne children; and of that number one hundred and nineteen had a laceration of the cervix uteri which was appreciable—that is, seventeen per cent. Since then he had examined five hundred and sixty-nine, of whom one hundred and seventy-one had a laceration of the cervix—that is, thirty per cent., the percentage being much greater than before. That might seem strange; possibly he had learned to detect the lesion in cases in which he could not before. Of twelve hundred and sixty-nine women, then, who had borne children, two hundred and ninety had a laceration of the cervix—that is, 22·06 per cent. Dr. Pallen, he believed, gave as high a percentage as 45; Dr. Emmet, as high as 33·3. He would say a few words regarding the indications for the operation; it should not be done when the laceration was slight and caused no symptoms. He agreed with Dr. Pallen, however, that, when the lesion was so considerable that the os lay wide open, and there was an eroded, everted cervical mucous membrane, although no particular symptoms had yet developed, it should be sewed up, else endometritis, hyperplasia of the uterus, chronic oöphoritis, or pelvic cellulitis might be set up, or carcinomatous degeneration take place. Another indication was a considerable and persistent discharge from the cervical mucous membrane, although the laceration might be slight. To cauterize it with the red-hot iron would relieve it only temporarily; a permanent cure could be effected only by sewing up the laceration. Another indication was endometritis, or a hyperæmic condition of the mucous membrane or of the endometrium proper. A patient of his had suffered from membranous dysmenorrhœa and abdominal pains for a long time, caused by such a condition; there was no discharge, simply because applications of nitric acid, iodized phenol, and galvanism had been made so frequently that none was allowed to form. Dr. Thomas favored an operation. The cervix was sewed up, and the patient was cured completely. Menorrhagia or metrorrhagia was another indication; the excessive flow came from the uterine cavity, caused by the hyperplastic condition of the endometrium or by vegetations. Remove them, and apply the tincture of iodine, and the menorrhagia might be cured for a short time, but the chances were that it would return unless the cervix were sewed up. Chronic congestion of the ovaries or oöphoritis might be either an indication or a contra-indication. It was a contra-indication during its existence; but after relieving it, if it had a tendency to return, the cure might be made permanent by sewing up the laceration. Areolar hyperplasia might be relieved by sewing up the lacerated cervix, upon which depended a condition of subinvolution of the uterus. The danger of subsequent carcinoma was another indication. Regarding reflex nervous phenomena as an indication, there was great difference of opinion. He would not attribute so much to laceration of the cervix as Dr. Emmet would seem to do; he had, however, seen patients with reflex neuralgia benefited by the operation. Neither he nor Dr. Seguin could discover any other cause for a case of persistent unilateral chorea recently, and with Dr. Seguin's consent he sewed up a laceration of the cervix. The result was yet to be seen. Regarding counter-indications, many were referred to incidentally in his remarks upon the indications. One of the chief counter-indications, pointed out by Dr. Lee and dwelt upon by those who preceded him in the discussion, was the existence of pelvic cellulitis; and he fully agreed with what had been said, that the operation should not be done so long as there was tenderness to indicate pelvic cellulitis or peritonitis. Sometimes, however, when this was difficult to relieve entirely; when it seemed to be kept up by the laceration; and the parts had become tolerant of manipulation by two or three months' application of the tincture of iodine, tannin-and-iodoform tampons, and injections of hot water, pulling together the lips of the wound, and making traction upon the uterus preparatory to the operation—he thought the operation could be done without great risk, and might result in a permanent cure. He so treated a patient last winter, and, after the lips of the wound could be brought in apposition without pain, he first put in two sutures, which caused no trouble; again two more; and, after a week or two, he pared the edges and put in eight, uniting the lacerated surfaces completely, and told the patient to remain in bed the usual length of time. She, however, got up on the fourth day, and spent the entire day down town at her place of business. She felt unwell in the evening, and sent for him. He had her remain abed, and on the eighth day took out the sutures. Contrary to his instructions, she got up the next day and went again to her work, but did not suffer from it. Her next menstruation was normal, and she was now entirely well. In another similar case of chronic cellulitis he operated, but failed to get union; he operated a second time, and effected a perfect cure without the least inflammatory reaction. He did not think tuberculosis was necessarily a contra-indication to the operation, and regretted not having performed it in one case.

Dr. W. M. Polk said the discussion had shown that there was considerable difference of opinion among the most experienced gynæcologists with regard to the proper limitations of the operation, the indications and the contra-indications, and the time when it should be performed. With regard to the latter point, he did not doubt that it should be done immediately after the accident for the purpose of checking considerable hæmorrhage; it was much better than the tampon. If it were not indicated to control hæmorrhage, he would postpone the operation. He did not think it would prevent the absorption of septic elements, as Dr. Pallen supposed, for the tissues were soft and flabby, not dense as they would become some weeks afterward, and the wound could not be so closed as to prevent the dangers of sepsis. Then, too, it was very difficult to have the conditions necessary to perform the operation—proper light, assistants, etc. He would leave the wound open, wash it with carbolized water and thus prevent absorption of septic material, and perform the operation, if it were called for, subsequently. He agreed with Dr. Mundé that, when a chronic oöphoritis, granulations causing hæmorrhage, and chronic trachelitis existed, all of which might be due to sub-involution, and it was evident that they depended upon the laceration of the cervix, the operation should be done to effect their cure—not postponed, waiting until their cure should be effected. A point of interest which might appropriately be raised on this occasion was, could anything be done to prevent laceration? The existence of cicatricial bands about the cervix, the necessity for the use of the forceps, for the introduction of the hand into the cavity of the uterus to perform version, etc., and for the graver operations in general during parturition, would lead them to anticipate more or less laceration; but the number of lacerations in normal labor might be diminished if the habit of rupturing the bag of waters early, which obstetricians were apt to practice more or less, were discontinued. In certain cases the cervix dilated slowly, particularly in primiparæ, and in order to expedite matters the obstetrician ruptured the bag of waters when dilatation had reached about the size of a trade-dollar, or greater, after which the chances were in favor of laceration of the cervix.

Dr. M. Putnam Jacobi said that, having carefully studied all Dr. Emmet's various descriptions of the lesion in question, it seemed to her that a certain discrepancy existed between some of his statements. From some of these, and from all his diagrams, it would seem that laceration of the cervix became a source of morbid symptoms only when the mucous membrane had become everted, irritated, and cicatricial. On other occasions Dr. Emmet seemed to attribute equal influence to cicatricial tissue existing anywhere in the parenchyma of the cervix. Now, it seemed to her that at least the distant reflex phenomena, which were so often observed and were so interesting, must have their starting-point in the mucous membrane, which, it was almost certain, was the termination point of the uterine nerves. Since reflex phenomena were dependent upon impressions made on peripheral terminations of nerves, rather than on their much less sensitive trunks, at all events it was often possible, in the lesion under discussion, to trace all the symptoms exclusively to the affection of the mucous membrane by the crucial experiment of causing them to disappear by treatment of this portion of the cervix, while the laceration remained untouched. In illustration of this, the speaker related the following case: A lady, who previously had never presented any uterine symptoms beyond a slight catarrh, was seized about two and a half years after the birth of her third child with marked motor paresis and numbness of the lower extremities. These symptoms increased to such severity that the patient was able to walk only with difficulty, and an incipient myelitis was suspected. Several elements were, however, lacking to establish this diagnosis, and finally a uterine examination was made, and led to the discovery of an extensive laceration of the cervix. The cervix was so much relaxed that it had become shaped like a funnel, with the apex at the internal os. Through the dilated os externum the mucous membrane projected in loose and hyperæmic folds. An operation was proposed and assented to; but, preparatory to this, applications were made to the mucous membrane of dilute nitric acid (used, not as a caustic, but as an astringent). After five or six of these, the condition of the mucous membrane had markedly improved;

it had shrunk within the cervical canal, and this had considerably contracted. The laceration, of course, persisted, but, with the change described, the morbid symptoms rapidly diminished, and so nearly disappeared that the patient refused to consent to the operation. She had since (during a period of nine years and a hals) remained nearly well. The case was quoted, not, of course, as an argument against the operation, but as helping to establish the real mechanism of the morbid phenomena for the relief of which this was desirable. In the study of this mechanism, again, the speaker called attention to the fact that sympathetic nerve fibers could not be considered the path of such morbid impressions. Impressions traversing the sympathetic fibers excited visceral symptoms, but those determining symptoms in the range of the cerebro-spinal axis necessarily passed by spinal nerves. In the cases in question, the spinal filaments were evidently those contained in the hypogastric plexus, and given to it from the sacral.

Dr. W. G. Wylie said the remarks of the last speaker were interesting, because original and possessing importance. With regard to the etiology of laceration, he thought it little likely.to occur when the uterus was healthy, except under extraordinary circumstances, as when the forceps had to be applied, version performed, etc.; that, when the lesion occurred, it could often be found that there had previously been an unhealthy state of the cervix—that it had been the seat of granular inflammation or other affection. He had paid special attention to this subject, and had in several instances been able to predict a rupture, because of an unhealthy state of the cervix, his prediction being fulfilled at the time of labor, although every precaution was taken against it. In one case, which Dr. Emmet saw, there was a flexure of the body of the uterus almost at right angles with the cervix, and, very much to their surprise, the woman became pregnant. He anticipated laceration, which did occur, but, as the forceps had to be used, it might be attributed to that fact, although he felt certain that it would have occurred without. An indurated cervix before and during pregnancy was, he believed, not only a cause of laceration, but also of nausea and vomiting before term. He had, therefore, dilated it slightly with his finger or a dilator in cases in which it seemed to be the cause of such reflex phenomena, and had thereby given relief and also brought about that preparatory softening before labor which prevented rupture. He thought the attempt to soften the cicatricial tissue upon the cervix, preparatory to the operation, was sometimes carried too far, and that the natural hardness of the cervix was sometimes erroneously taken to be cicatricial; that the vaginal structure was rendered soft and flabby, in marked contrast to the degree of softening of the cervical tissue.

In closing the discussion, Dr. Lee declined to discuss in detail the views that had been expressed, as the hour was late; but desired simply to thank the members of the Society who had spoken so fully, and to felicitate himself on the fact that his paper had evoked so full an expression of opinion. He had hoped that the discussion might have rather taken the direction indicated by Dr. Polk as to the prevention of the lesion, but the future would doubtless settle that.

THERAPEUTICAL SOCIETY OF NEW YORK.

The third annual meeting was held at the house of the President, Dr. Jacobi, on Friday, October 8, 1880, at 8 p. m.

In accordance with the resolutions passed at the last meeting, the following changes in the by-laws were adopted:

Article I was amended so as to read as follows: Any medical man in good standing may, upon the written recommendation of a member and the approval of the council, become a member of the Society, provided only that the entire number of members shall not exceed sixty.

Article V was amended by striking out paragraphs 6 and 7, and substituting the following: The scientific material collected by the Society, after being digested in the several committees, shall be placed in the hands of the council, and by them presented in such manner as they may deem for the best interests of the Society.

Article VI, Paragraph 6, was amended so as to read as follows: The meetings of the Society, except the annual meeting, shall be held at such times and places as may be determined by the council. The annual meeting shall be on the second Friday in October in each year.

The following-named gentlemen were then elected resident members: Drs. George F. Shrady, W. R. Birdsall, G. H. Sweezy, George G. Wheelock, J. A. McCreery, L. Bolton Bangs, and Alexander Hadden; and the following as corresponding members: Drs. Robert Amory, Brookline, Mass.; R. T. Edes, Boston; Mr. C. McNamara, London; Drs. Little, London; D. W. Prentiss, Washington; Stephen Dodge, Halifax; J. H. Packard, Philadelphia; Henry D. Holton, Brattleboro, Vt.; A. Vanderveer, S. O. Vanderpoel, D. Snow, Albany, N. Y.; Henry M. Field, Newton, Mass.

The following officers were elected for the ensuing year: *President*, Dr. ANDREW H. SMITH; *First Vice-President*, Dr. E. C. SEGUIN; *Second Vice-President*, Dr. H. T. HANKS; *Recording Secretary*, Dr. O. B. DOUGLAS; *Corresponding Secretary and Treasurer*, Dr. V. P. GIBNEY; *Councilors*, Dr. E. R. SQUIBB, Dr. T. E. SATTERTHWAITE.

Reports on the Progress of Medicine.

MONTHLY REPORT ON OBSTETRICS AND GYNÆCOLOGY.

No. VIII.

BY FRANK P. FOSTER, M. D.,
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OBSTETRICS.

1. MILLER, H.—Introductory lecture to the clinical obstetric course of 1881, in the Glasgow Maternity Hospital. "Glasgow Med. Jour.," June, 1881.
2. BUDIN, P.—Note comparative sur l'enseignement des accouchements à Paris et à l'étranger. "Progr. Méd.," June 25, 1881.
3. WILLIAMS, D. M.—Abstract of two thousand five hundred consecutive cases in midwifery practice. "Brit. Med. Jour.," July 2, 1881.
4. ROSS, G.—A case of pseudo-cyesis, or phantom pregnancy. "Canada Med. and Surg. Jour.," June, 1881.

5. Ruge, C.—Ist die Deciduazelle für die Gravidität charakteristisch? "Centralbl. f. Gynäk.," June 11, 1881.

6. Duval.—Réflexions sur l'embryologie. [Soc. de Biol., Paris.] "Progr. Méd.," June 4, 1881.

7. Budin, P.—Note sur un procédé qui permet de mieux constater les caractères de la région dorsale du fœtus lorsqu'on pratique la palpation abdominale et de mieux entendre les bruits du cœur fœtal lorsqu'on pratique l'auscultation à la fin de la grossesse. *Ibid.*, May 21, 1881.

8. Ross, W. S.—Vomiting in pregnancy. "Med. Bulletin," July, 1881.

9. Campbell, W. M.—Belladonna in the sickness of pregnancy. "Brit. Med. Jour.," June 4, 1881.

10. Hill, W. S.—Benzoic acid in the albuminuria of pregnancy and scarlatina. "Am. Jour. of the Med. Sci.," July, 1881.

11. Voorhees, S. R.—Hysteralgia during gestation. "Obstet. Gaz.," June, 1881.

12. Schwing, K.—Ein Fall von Schwangerschaft und Geburt, komplicirt mit einem enorm grossen primären Leberkarcinom. "Centralbl. f. Gynäk.," June 25, 1881.

13. Rosenstirn, J.—Kolossale Haematocele retro-uterina in Folge der Applikation eines starken galvanischen stromes am schwangeren Uterus zum Zwecke der Abortion. Schneller Schwund des ausgedehnten verhärteten Extravasats durch Massage. *Ibid.*

14. Wherry, G. E.—Criminal abortion; a fœtus of three months cut up while in the uterus; peritonitis; recovery. "Brit. Med. Jour.," June 4, 1881.

15. Crummer, B. F.—Acute spontaneous inversion of the uterus, occurring after abortion. "St. Louis Med. and Surg. Jour.," July, 1881.

16. Stokes, J. G.—Habitual abortion. "Indiana Med. Reporter," May, 1881.

17. Reamy, T. A.—Induction of premature labor. [Cincinnati Acad. of Med.] "Obstet. Gaz.," June, 1881.

18. Rohé, G. H.—A probable cause of tardy, painful labor, not hitherto recognized. "N. Y. Med. Jour. and Obstet. Rev.," Aug., 1881.

19. Davis, J. W.—Several cases in midwifery, illustrating the absence of pain in labor. "Nashville Jour. of Med. and Surg.," June, 1881.

20. Hickinbotham, J.—Two cases of labor at term in which the hymen was unruptured. "Brit. Med. Jour.," June 25, 1881.

21. Fuqua, W. M.—Labial hæmatocele. "Louisville Med. News," June 18, 1881.

22. Somerville, R.—Two cases of puerperal hæmatocele. "Edinb. Med. Jour.," July, 1881.

23. Lambl, D.—Primitive Spondylolysis und deren Verhältniss zur Steatopyga an der hottentottischen Venus. "Centralbl. f. Gynäk.," May 28, June 11, 1881.

24. Sang, W.—Fibroid tumor of the uterus complicating labor; delivery with forceps. "Edinb. Med. Jour.," July, 1881.

25. Thorburn.—Axis-traction forceps. [Manchester Med. Soc.] "Brit. Med. Jour.," June 25, 1881.

26. Turner, W.—Delivery by the breech through a greatly narrowed, flat, rachitic pelvis. "Edinb. Med. Jour.," July, 1881.

27. Whittaker.—A case of dystocia.—Use of the cranioclast. [Acad. of Med., Cincinnati.] "Cincinnati Lancet and Clinic," July 9, 1881.

28. Galton, J. H.—Case of Cæsarean section. "Lancet," June 4, 1881.

29. Simpson, A. R.—Clinical lecture on a case of Cæsarean hystero-oöphorectomy, or Porro's operation; with remarks. "Brit. Med. Jour.," June 11, 18, 1881.

30. Cohnstein.—Zur Sectio Cæsarea. "Centralbl. f. Gynäk," June 11, 1881.

31. Sänger.—Ein glücklicher Fall von Sectio Cæsarea nach alter Methode mit Demonstration der Operirten. [Gesellsch. f. Geburtsh. in Leipzig.] "Dtsch. med. Woch.," May 21, 1881.

32. Coombs, C.—Placenta prævia. "Brit. Med. Jour.," June 25, 1881.

33. Stuart, F. H.—Puerperal hæmorrhage. "Proc. of the Med. Soc. of the County of Kings," July, 1881.

34. Gilfillan, W.—Ante- and post-partum hæmorrhage. *Ibid.*

35. Vanderveer, J. R.—Post-partum hæmorrhage. *Ibid.*

36. Wallace, W.—Placenta prævia. *Ibid.*

37. Skene, A. J. C.—Causes of puerperal hæmorrhage. *Ibid.*
38. Lamadrid, J. J.—Treatment of post-partum hæmorrhage. *Ibid.*
39. Clarke, A. S.—Hæmorrhage during labor. *Ibid.*
40. Burge, J. H. H.—The placenta as a tampon. *Ibid.*
41. Clark, J. E.—Post-partum hæmorrhage. *Ibid.*
42. Thomas, T. G.—Treatment of puerperal hæmorrhage. *Ibid.*
43. Dolan, T. M.—Puerperal mortality in workhouses. [Letter.] "Lancet," June 4, 1881.
44. Lothrop, T.—Notes on puerperal cases. "Buffalo Med. and Surg. Jour.," July, 1881.
45. Elliot, G. T.—A résumé of twenty-six cases of puerperal fever, which have occurred in the lying-in ward of the Charity Hospital, from Sept. 20, 1880, to Feb. 1, 1881. "New Orleans Med. and Surg. Jour.," July, 1881.
46. Parish, W. H.—Some points in the consideration of puerperal septicæmia. "Cincinnati Med. News," June, 1881.
47. Bennet, E. H.—Puerperal malarial fever. "Coll. and Clin. Record," June 15, 1881.
48. Palmer, C. D.—Vaginal and uterine injections in the puerperal state. "Cincinnati Lancet and Clinic," June 18, 1881.
49. Walter.—The various uses of intra-uterine injections of hot water in obstetric practice. [Manchester Med. Soc.] "Brit. Med. Jour.," June 25, 1881.
50. Reid, W. L.—On the use of antiseptics in obstetrics and gynæcology. "Glasgow Med. Jour.," June, 1881.
51. Duncan, M.—Case of phlegmasia dolens with lymphatic varix. [Obstet. Soc. of London.] "Brit. Med. Jour.," June 4, 1881.
52. Coniglione, A.—Contribuzione allo studio del rilasciamento delle sinfisi pubica e sacro-iliache. "Giorn. Internaz. delle Sci. Med.," iii, 3, 1881.
53. Erich.—Extra-uterine pregnancy—removal of decomposing fœtus through umbilicus. [Baltimore Acad. of Med.] "Obstet. Gaz.," June, 1881.
54. Legendre.—Grossesse extra-utérine abdominale.—Communication du kyste avec les 2 trompes et ouverture dans l'S iliaque. [Soc. Anat., Paris.] "Progr. Méd.," May 21, 1881.
55. Galliard, L.—Grossesse tubaire.—Rupture au milieu du troisième mois.—Mort.—Examen de la caduque utérine. [Soc. Anat., Paris.] *Ibid.*, June 4, 1881.
56. Galabin.—Extra-uterine associated with intra-uterine fœtation; abdominal section. [Obstet. Soc. of London.] "Brit. Med. Jour.," June 4, 1881.
57. Underhill, C. E.—Historical note on a case of abdominal section in the sixteenth century. [Obstet. Soc. of Edinburgh.] "Edinb. Med. Jour.," July, 1881.
58. Bull, C. S.—Purulent, croupous or membranous, and diphtheritic conjunctivitis in infants. [Spec. art.] "N. Y. Med. Jour. and Obstet. Rev.," July, 1881.

2. As regards the facilities for *instruction in obstetrics in Paris*, M. Budin compares them with those of various other places, to the disadvantage of the former. It appears that in England there are eighteen schools, each with a chair of obstetrics, and that the students in attendance are as follows:

	Students.
University College Hospital, London	284
St. George's Hospital, London	120
St. Mary's Hospital, London	96
St. Thomas's Hospital, London	140
St. Bartholomew's Hospital, London	344
Westminster Hospital, London	46
Middlesex Hospital, London	96
Guy's Hospital, London	324
King's College Hospital, London	04
Charing-Cross Hospital, London	128
London Hospital, London	132
Loodon School for Women, London	36
University of Durham	60
Owen's College, Manchester	288
Leeds School of Medicine	124
Bristol School of Medicine	45
Birmingham School of Medicine	40
Sheffield School of Medicine	24
Total	2,421

In Scotland there are six chairs of obstetrics to 1,566 students; in Austria, six chairs to 1,505 students; in Belgium, four chairs to 238 students; in Switzerland, three chairs to 404 students; in

Germany, twenty-one chairs to 4,405 students (4,094 of the latter being Germans, and 311 foreigners); and in Italy, seventeen chairs to 3,455 students. In Paris, on the other hand, there are but two chairs of obstetrics, one for didactic and the other for clinical instruction. In the year 1850 there were 5,100 matriculants, making one chair for 2,550 students. These numbers do not include those who make but a brief stay in Paris, but only those who are regularly entered and expect to come up for examination. In Germany and Austria, however, all are included who attend the courses at all. While, in most of the other places, students are allowed to be present at the confinements of women to whom hospital aid is afforded, in Paris there is but one institution, the Clinique de la Faculté, that furnishes such facilities for instruction, the Maternité being reserved for women who are to become midwives, while the Hôpital Cochin is not open to students at all. Taking the average of all the other places alluded to, there is one chair for 187 students, while in Paris there is only one for 2,550. Elsewhere, too, a clinical service is attached to almost every chair, but in Paris there is but one clinic available for students.

5. Ruge gives a negative answer to the question, *Is the decidual cell diagnostic of pregnancy?* No doubt it is most commonly met with in the decidua vera, but he has met with it, perfectly characterized, in cases of endometritis, especially of the more chronic form, and in those of membranous dysmenorrhœa, in which there was no pregnancy.

7. M. Budin proposes *a method of facilitating fœtal palpation and auscultation.* When the back has once been made out by palpation, it often happens that, on trying to demonstrate it to students, the latter are unable to recognize it. This is not wholly owing to lack of skill on their part, but is partly due to the fœtus having changed its position. To prevent this, pressure should be made upon the abdominal aspect of the fœtus, so as to force the back more decidedly toward the surface and hold it there. At the same time the back may be rendered more prominent by forcing the two poles of the fœtus together, thus increasing the curve of the trunk. As a matter of course, these manipulations bring the fœtal heart nearer to the ear applied over it, and so render it easier to distinguish the cardiac sounds.

9. Dr. Campbell has used *belladonna in the vomiting of pregnancy* in several severe cases that had resisted all the usual remedies, and has got better results with it than with any other drug. He gives from two to five minims of the tincture, in water, every hour.

10. Dr. Hill gives notes of four cases in which he used *benzoic acid in the albuminuria of pregnancy and scarlet fever* in doses of one tenth to two grains, frequently repeated, with the result of rapidly causing the albumen to disappear from the urine.

16. Dr. Stokes vaunts *the use of emetics to prevent abortion.* He intimates that they will succeed in all cases if the child is alive, and if there is no malformation or hereditary trouble. The action must be thorough, "vomiting the patient from three to six hours." This treatment, he says, is also admirable for the vomiting of pregnancy. He regards emetics as perfectly harmless at any period of gestation. He uses powdered ipecac, with a small quantity of tartarized antimony. "Adopt this course of treatment," is his fervid peroration, "and you will not only not regret it, but many, many ladies will 'rise up and call you blessed.'" [For the present, we are willing that others should receive all the benedictions to be won by this course.]

25. Dr. Thorburn decries the various forms of *axis-traction forceps* in general, but grants that such a device is occasionally useful when the head is at or above the brim. He prefers, however, an auxiliary instrument that he has had made, and that he terms the "*aide-forceps.*" It consists of two rods, properly curved, that can be hooked, by means of safe clips, into the fenestræ of any ordinary forceps, and that unite in one tractile handle. All fixture-screws and irremovable traction-rods detract, he thinks, from "the present incomparable instrument."

26. Dr. Turner's case of *extraction by the breech through a contracted pelvis* is chiefly of interest on account of the peculiar method by which traction was exerted, and from the fact that the child survived notwithstanding the disproportion between the size of its head and that of the pelvis. A foot presented, and after full dilatation the other foot was brought down. A single strong pain, aided by slight traction, sufficed to expel the body. Both arms were then found extended above the head, which was itself in a state of extension. Rapid delivery was called for, as the pulsations of the cord had come down to 60 a minute. After bringing down the arms, which were reached with difficulty, the head resisted the combined force of traction and external pressure. The chin was found high up on the right side, and without using much force it was brought down into such a position that the head lay directly in the transverse diameter of the pelvis, neither extended nor flexed. It resisted further attempts at flexion. A towel having now been folded around the child's body, to prevent the operator's hands from slipping, the body was grasped with the right hand in the region of the loins, while the left hand laid hold on the shoulders. Pressure on the abdomen was maintained constantly during the pains, while continuous strong traction was also kept up at such times, the child's body being now drawn backward on the perinæum, now pulled forward toward the pubes. No lateral traction was employed. On the last occasion, after less than four minutes' continuous traction, the head yielded somewhat suddenly. Forward rotation of the occiput took place abruptly, and the extraction of the head was completed easily and speedily. The continuous traction was at one time in the axis of the brim, at another in the axis of the outlet, more time being devoted to the former than to the latter. The head was thus made to advance in the one direction with the left parietal bone rotating round the promontory of the sacrum, in the other with the right parietal rotating round the pubes, the abdominal pressure serving to hold the advantage gained by each of these movements. The measurements of the pelvic brim were: conjugate, 2¾ in. (⅛ in. greater, owing to a furrow at the symphysis, than the distance from the promontory to a point half an inch distant from the middle line of the pubes on either side); transverse, 5 in.; oblique, 4½ in.—those at the outlet were: conjugate, 4¼ in.; transverse, 5¼ in. The dimensions of the child's head, taken twelve hours after birth, were: occipito-frontal diameter, 4⅝ in.; biparietal, 3¾ in.; bitemporal, 3¼ in.; bimastoid, 3⅛ in.; suboccipito-bregmatic, 3⅞ in.; occipito-mental, 5½ in.; occipito-frontal circumference, 13½ in.; suboccipito-bregmatic, 12 in.

30. In this short article on *Cæsarean section*, Cohnstein maintains that we should not jump to the conclusion that Porro's operation affords the mother a better chance, but should bear in mind that the rate of mortality attributable to the old operation has been deduced from cases the great majority of which occurred before the days of antiseptic surgery, whereas Porro's method has largely had the benefit of the improved technics involved in the latter. The problem remains, then, to improve the old operation in such manner as to lessen hæmorrhage and the risk of peritoneal infection. The author recommends the following modifications of the operation: 1. The uterus should be lifted out of the abdomen before it is incised. Loss of blood when the incision is made can then be controlled easily by compressing the aorta. 2. Uterine sutures are of no advantage. To insure good contraction, the operation should be done at the close of the first or the beginning of the second stage of labor. The posterior wall of the organ should be incised, not the anterior, because the former is thicker and more muscular, and therefore more likely to contract well. 3. By lifting the uterus out of the abdomen the edges of the wound can be pressed together more firmly. 4. If the uterus is opened in front, the anteflexion that afterward takes place may easily cause vascular stasis and even hæmorrhages; but, if it is opened behind, the same anteflexion has a favorable effect upon the wound. Moreover, the weight of the abdominal organs falls upon the posterior wall, and the latter is more accessible for the application of an ice-bladder than the anterior wall. 5. Drainage through Douglas's space, that has proved of such advantage in rupture of the uterus, is more likely to prove effectual when the incision has been made in the posterior than when it has been made in the anterior wall.

37. In enumerating *the causes of post-partum hæmorrhage* Dr. Skene makes up very much the sort of list that we are accustomed to find in the text-books, adding, however, the predisposing influence of imperfect development of the sexual organs, especially the uterus, and making some remarks about the influence of deranged states of the uterine circulation which he himself thinks "may be considered as rather speculative" [but quite tenable, it seems to us].

39. Dr. Clarke's paper on *intra-partum hæmorrhage* is an admirably condensed account of our knowledge of that subject. He alludes to an interesting case of profuse hæmorrhage due to a laceration involving the circular artery, in which he checked the bleeding by hastening delivery with the forceps.

40. Dr. Burge advises non-interference with the placenta, as a rule, as of the utmost importance in preventing *post-partum hæmorrhage.* "If the placenta is in the womb," he says, "its presence there is the best possible stimulus to contraction—better, in my opinion, than any one's hand, and if, from any degree of inertia, the womb is indisposed to contract, then the placenta (if detached) is the best possible tampon." [It may be the "best" tampon, but we have heretofore labored under the impression that anything acting as a tampon in inertia of the uterus post partum was in the highest degree dangerous; and we confess that Dr. Burge's article does not alter that feeling.]

42. From the several topics discussed in Dr. Thomas's forcible paper, we select that of *the treatment of post-partum hæmorrhage.* The particular point urged was this: In ninety-nine out of a hundred cases, seen before the woman's nervous system was entirely prostrated, if the hand was properly introduced to the fundus of the uterus, everything turned out, and the walls of the organ irritated with the fingers, firm uterine contraction would take place. There was no remedy to be compared with it, any more than there was any remedy in the treatment of malarial fever to be compared with quinine. He did not believe there were other agents which stimulated the uterus more than the hand. There were things which had stimulated the uterus to contraction where the hand had failed, but it was the hand of a man who had not used it properly. With reference to the injection of a solution of iron, as recommended by Dr. Barnes, he rejected the measure entirely and absolutely, except as a *dernier ressort.* Hot water might be injected to the fundus with perfect safety, or put there in a sponge, and it would be very likely to stimulate the uterus; but not nearly so well as the hand. It was not the hot water contained in a sponge, but the sponge itself, which, as a foreign body, was brought in contact with lax fibers of the uterine wall, that stimulated them to contraction. Another substance which had been used was the tincture of iodine; and still another, which he regarded as better than iodine, and which had been highly recommended by Dr. Penrose, of Philadelphia, was common vinegar. One advantage which vinegar possessed was, that it could be obtained in any house. It could be carried in upon an ordinary handkerchief, or bit of soft cloth, and swept over the walls of the uterus, and two things were accomplished: 1. The introduction of a foreign body caused the uterine fibers to ligate the bleeding vessels; and 2. The vinegar probably had some influence in causing coagulation of blood. But he was not sure that it was not the hand even then which accomplished the end desired. In the hypodermic use of ergot we had a most valuable measure to aid us in securing uterine contraction. To give this remedy by the rectum was hardly practicable, and if administered by the mouth the woman would almost certainly vomit at once; and besides, if it remained in the stomach, he doubted if it was absorbed under such circumstances. The hypodermic injection of 15, 20, or 30 drops of sulphuric ether stimulated the nervous system, and in that way aroused the uterus to accomplish its work. But there was one remedy which had been overlooked. In works on obstetrics it was scarcely mentioned; and it had received very little mention in periodical literature. It was the faradaic current applied directly to the uterine wall. He had employed it in only one case, but others had used it successfully, and in his case it was either a coincidence or an extraordinary result. Almost everything had been used except Dr. Barnes's method, and without permanent result; but when he took one flat sponge electrode and carried it into the uterine cavity, and placed the other upon the nape of the patient's neck, and allowed a strong current to pass, firm uterine contraction immediately ensued, which seemed to save the woman's life. Although this was but a single case, he thought the remedy worthy of a fair trial. The question arose, Why had it not been tried before? Chiefly because a battery was not at hand and could not be obtained, and when obtained, as a rule, it would not work, ever under any circumstances. But those days had passed. Nearly every physician had a battery now; and a good battery could be obtained much more readily anywhere than good ergot, except in Brooklyn. In conclusion, he would say that in the treatment of post-partum hæmorrhage the rule should be this: If the hæmorrhage was slight, and for good reasons we did not wish to pass the hand into the uterine cavity, we might try the hypodermic use of ergot; apply excessive cold or excessive heat to the fundus, force the uterus into firm contraction under our hand, and never let go of it until the woman stopped bleeding. How long should we hold the uterus? He had repeatedly held it, under such circumstances, for twelve hours. But suppose it failed and the hæmorrhage continued. Then we should wash the hand and arm thoroughly with soap and water, use a nail-brush thoroughly, dip the hand and arm in warm, strong carbolized water, and, without wiping them, carry the hand up to the fundus uteri, sweep everything out, and keep the hand there until the uterus contracted. The pulp of the fingers should be passed up and down the sides of the uterus in any direction, and at the same time counter-pressure made from the outside with the other hand upon the wall of the abdomen. If this failed, what next? It was a bad case, and we might resort to anything that produced a decided shock to the nervous system—give ergot, brandy, and ether hypodermically, and, lastly, give a fair trial to the faradaic current.

49. Dr. Walter urges the value of *intra-uterine injections of hot water* under the following conditions: 1. For the purpose of checking post-partum hæmorrhage. The temperature of the water should be as high as 104° F., but not above 110°. For the other purposes it should be from 115° to 120°, the object being to cause relaxation and dilatation of the uterus. 2. In podalic version, especially if, from the early escape of the liquor amnii, the uterine walls have become molded to the body of the fœtus, rendering the introduction of the hand dangerous or almost impossible. 3. Whenever cephalic version is difficult. 4. When bipolar version is difficult from escape of liquor amnii, and has to be done quickly, before the os is much dilated, as in cases of partial placenta prævia or some severe cases of accidental hæmorrhage. 5. In rectifying malpresentations, such as returning a hand or an arm into the uterus, or in changing a presentation of the face or brow into one of the vertex. 6. To overcome irregular contractions of the uterus, or what is known as hour-glass contraction, with retained placenta; also in cases of retention of the placenta or membranes in abortion. 7. When the use of anæsthetics is impracticable, the injections would not only aid version, but, by dulling the sensibility of the uterine tissue to pain and lessening its susceptibility to contusion, diminish the danger of rupture and the risks of metritis. He also regards these injections as useful in cases of rigid os (implicating the whole cervix or the lower muscular fibers of the uterus), locked twins, and monsters.

50. Dr. Reid describes *the use of antiseptics in midwifery* as carried out at the Landesgebäranstalt at Prague. The hospital is strictly clean, and is often disinfected. Every physician, student, and midwife is supplied with a two-per-cent. solution of carbolic acid, permanganate of potassium, soap, nail-brush, and nail-scissors, and before entering a ward must wash the hands in soap and water, cut the nails if necessary, and use the nail-brush and then the disinfecting fluid. If a midwife is seen once with nails imperfectly cleaned she is reproved; if a second time, unrelentingly dismissed from the hospital. Before and after every vaginal examination the hands are washed with a disinfecting fluid. The professors, assistants, and chief midwives are expected to set a perfect example to those below them in office. Near the end of pregnancy, if there is much leucorrhœal discharge, if it is fœtid, or if the patient is feverish, a two-per-cent. [? carbolic-acid] vaginal injection is given cautiously twice a day. When labor begins the woman is put on a bed that has been cleaned and purified carefully. Her hands and nails are thoroughly cleansed, and, together with the genitals and the lower parts of the body, are washed with a two-per-cent. solution of carbolic acid. After the membranes burst, a three-per-cent. solution is injected into the vagina every two hours, especially if the amniotic fluid is fœtid, if the child is known to be dead, if the head is not yet engaged, if the patient is feverish, if the presentation is abnormal, if the patient has come from the general hospital, or if the placenta is retained. When once the perinæum begins to be strained, two hand-sprays are brought into use and continue to play until the placenta has been removed. For the first three days the vagina is washed out three times a day, and afterward twice a day until the lochial discharge ceases. If the latter becomes putrid, a three-per-cent. solution is used every three hours. In all cases of instrumental or unusual manual interference the steam-spray is used. The lochial discharge is received on napkins that have been rendered antiseptic, or on carbolized cotton-wool, which is afterward burned. Three-per-cent. intra-uterine injections are given if there has been any special manual or instrumental interference, if the labor has been protracted, if the fœtus has been dead, if gas or putrid amniotic fluid has passed from the uterus, if the temperature has risen, or if delivery has taken place on the street. Intra-uterine injections are used (of three- to five-per-cent. carbolized water or one- to three-per-cent. chlorine water) if the temperature has risen and there is a suspicion of infection, if shivering takes place, or if the lochia become fœtid. Spasmodic contraction of the cervix, complete involution of its vaginal portion, deep lesions of the cervix, rupture of the uterus, parametritis, and perimetritis are held to contra-indicate intra-uterine injections. Continuous irrigation of the interior of the uterus for ten or twelve hours at a time has lately been used in bad cases, and if the temperature is high the carbolized water is iced.

56. Dr. Galabin's case of *laparotomy for extra-uterine pregnancy* is specially interesting from the fact that there was concomitant intra-uterine gestation. The patient expected her second confinement in September, 1880. During the fourth and fifth months of pregnancy she had considerable pain and tenderness in the right side of the abdomen. Two tumors were discovered; that on the left side gave the usual evidences of fœtal life, and was clearly the gravid uterus; over the tumor on the right side nothing could be heard by auscultation. The physicians in attendance concluded that there was probably an ovarian tumor complicating pregnancy. On June 16th symptoms of rupture suddenly occurred, followed by those of peritonitis. The outline of the right-hand tumor was then found to have disappeared. The patient's state became critical, and Dr. Galabin reached her on the evening of the 19th. From the history, he was inclined to agree to the diagnosis of ruptured ovarian cyst, but the possibility of combined extra- and intra-uterine pregnancy was suggested. An exploratory operation was performed on the morning of the 20th. A large quantity of blood and clot was found in the peritoneal cavity, also an extra-uterine fœtus contained only in its thin membranes. The placenta, attached to the posterior surface of the uterus and the right broad ligament, was left *in situ*, and a drainage tube was left in the wound, entering the general peritoneal cavity. The operation was done under carbolic spray. The patient did well for two days, and the temperature never rose above 99·8° F.; but labor came on on the morning of the 22d, and a dead child was extracted by the breech. Although little blood was lost by the vagina, a good deal escaped through the drainage tube. The latter flow continued, and the patient died on the 24th, apparently from hæmorrhage. Dr. Galabin attributed the secondary hæmorrhage to the further detachment of the extra-uterine placenta from the posterior wall of the uterus as the result of the shrinking of the latter during labor. Both fœtuses appeared to be of about six and a half months' development. The extra-uterine one weighed only a pound and a half, while the other weighed two pounds and three quarters.

57. Dr. Underhill brings to light the record of a case of *laparotomy for extra-uterine pregnancy* (for such, as he justly remarks, it must have been, although the operator evidently supposed that he had removed a fœtus from the uterus) performed in the sixteenth century. The following is Dr. Underhill's translation from a collection of cases made by John Schenck, of Grafenberg, and published at Frankfort in 1609 under the title of "Observationum Medicarum, Rararum, Novarum, Admirabilium, et Monstrosarum Volumen." "In the month of March of the year 1540, at Castrum Pomponii, commonly called Pomponischi, in the province of the Lords of Gonzaga, not far from the river Po, there lived a woman whose name was Lodovica; but, in consequence of her great size, she was commonly called La Cavalla. Now this woman had at one time been pregnant; the fœtus had died in utero, and the soft parts had become putrid and been discharged through the vulva, while the bony parts had been retained within her. When she had recovered her health she again became pregnant. Her health soon became seriously impaired, and she passed into a condition of the greatest danger. At this time there chanced to come to these parts a certain surgeon whose name was Christopher Bain, one of those who journey about, passing from town to town. As soon as he had heard of this woman's condition, which was fully explained to him by some of the neighbors, he offered to try and restore her to health, on condition that they should put her unreservedly into his hands, including her body if she died (*ac mortuam*), and should agree to pay him ten golden pieces if she recovered. Her relatives, who were poor persons, accepted his offer, some of the wealthier people in the neighborhood helping them, and promising to pay the money. The man, who was ignorant of letters, but a bold fellow, had the woman tied up, and set about the operation. Having slowly dissected through the longitudinal muscles of the abdomen and the peritonæum, he at last opened the uterus itself and extracted the skeleton of a male child. He washed out the uterus with warm wine mixed with certain aromatics, and united the lips of the wound by a suture, having burned with the actual cautery the part that was sewn in (*candentique ferro partem inconsutam inurit*). Wonderful to relate, the woman recovered, and in due time bore the other child, not only alive, but absolutely uninjured in any way." Dr. Underhill gives good reasons for regarding this narrative as authentic, and remarks that, as extra-uterine pregnancy seems to have been unknown in those days, it is quite natural that the operator should have mistaken the sac for the uterus. It is likely, he adds, that a communication had existed between the sac and the vagina, in the shape of a fistula, that had afterward become occluded.

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1. [*Rest, food, and passive exercise for chronic invalidism resulting from uterine disease* may, perhaps, as well as any other phrase, express the essentials of Dr. Weir Mitchell's plan of treatment in so far as the domain of gynæcology is concerned. We need not describe the details of the method, but will refer those of our readers who are not already familiar with them to Dr. Mitchell's wonderfully attractive little book, entitled, "Fat and Blood, and how to make them."] Dr. Playfair gives glowing testimony as to the results he has achieved by means of Dr. Mitchell's plan in cases characterized by the well-known train of morbid conditions of the system at large which, while originally due to pelvic disease, have by their long continuance taken such firm root in the patient's make-up, and become so integral a part of her, so to speak, that whatever ingenuity may devise in the way of treatment addressed to the uterus and its surroundings falls flat as regards any lasting amelioration of the general condition.

6. Dr. Wallace relates a case of extensive *laceration of the perinæum*, reaching full two inches up the rectum, which healed spontaneously. No treatment was employed save directing the nurse to keep the wound clean. Not even were the knees tied together. In less than two months the wound was perfectly healed, the normal action of the sphincter being restored, and at a subsequent confinement scarcely any trace of the cicatrix could be discovered. [The letter in which Dr. Wallace describes this case is headed "Unnecessary Operations in Uterine Surgery," and seems to show the writer's approval of an article by Dr. Clifton E. Wing, that had shortly before been published under that title in the same journal. Dr. Wallace's case is an interesting example of what may take place, but we can not admit that it exemplifies what is likely to take place in cases of severe laceration of the perinæum. Therefore it should be allowed but little weight as evidence that the operation for laceration is unnecessary in general.]

12. Schücking reports gratifying success with *permanent irrigation of the* *bladder for cystitis* in cases that had resisted other methods of treatment, including permanent drainage. He considers the anatomical relations of the bladder to be such that, with the patient lying on her back, mere drainage does not suffice to keep the bladder wholly free from putrescent urine. Permanent irrigation does accomplish it, and without any more irritation of the mucous membrane than is caused by a drainage tube. The fluid employed by him was a ten-per-cent. solution of sulphite of sodium, to which five per cent. of glycerine was added. In two instances it was kept warm by a small spirit-flame under the irrigator.

13. Dr. Kenworthy's case of *foreign body in the uterus* was that of a lady who inserted a hair-pin into her own uterus with the idea of dilating the cervical canal for dysmenorrhœa. The implement slipped entirely into the uterus, and the family physician, failing to discover it, advised the patient to seek further aid in Jacksonville, Florida, a hundred miles away. She accordingly presented herself to Dr. Kenworthy on the ninth day after the insertion of the pin. He found marked tenderness and engorgement of the uterus, and ordered rest and appropriate treatment. The next day, on examination, he found the bent portion of the pin in contact with the fundus, and that the points had penetrated the substance of the uterus an inch and a quarter above the os externum. He attempted to dilate the cervix with sponge tents, but had to desist on account of the irritation set up by them and the pin. Five days afterward he introduced a Sims's speculum, and endeavored to reach the pin with his index finger, introduced to the first joint, but could not feel it. He then cut off the point of a small catheter, with the intention of dislodging one point of the pin, and passing that instrument over it, and, by releasing and holding the other point with forceps, remove both. A careful examination developed the fact that three quarters of an inch of each point of the pin was imbedded in the cervical portion, and that the bent portion was in contact with the fundus. The operator endeavored to dislodge the points of the pin, but found so much resistance from the fundus that he concluded that, if he persisted in his efforts, he might injure, if not perforate, the fundus. He then made traction on one leg of the pin, and the points appeared at the posterior and inferior portion of the cervix; he drew them downward until the bent portion came in contact with the uterine wall, and then passed a blunt hook through the bent portion, and extracted it through the cervix and external os without difficulty. In four days the patient was able to leave for home.

15, 16. M. Trélat describes certain devices for facilitating *the introduction and removal of sutures in cases of vesico-vaginal fistula.* In a case of very large fistula he employed a needle resembling the one that he uses in uranoplasty, so constructed as to allow of opening and shutting its eye. Having pierced one lip of the fistula from without inward, the hooked wire was engaged in the eye (opened for the purpose and then closed), and the instrument was withdrawn, the wire following from within outward. The same manœuvre was repeated on the opposite lip of the fistula, and the suture was in place. The method is not tedious, for he was able to apply twelve sutures in fifteen minutes in this way. The removal of the sutures is often needlessly postponed, owing to the difficulty of accomplishing it without disturbing the tender cicatrix. It would be better to remove them by the fifth or sixth day. To do away with the difficulty of removing them, it is better to leave the ends long, twisting each suture separately, and then bringing them all together in a bundle. To withdraw them, the bundle should be separated, and the individual sutures untwisted. This makes it easy to see where to cut each one. He recommends that not more than two of the sutures should be of wire, using silk for the others.

17. Māurer performed a *plastic operation for recto-vaginal fistula* in a case in which he had previously failed in an attempt to close the opening by the usual method. The fistula was situated in the thinnest part of the recto-vaginal septum, was surrounded by unyielding cicatricial tissue, and was to be reached only through a contracted vaginal outlet, above which the vagina was much narrowed and stiffened by cicatricial contraction. The fistulous opening was quadrangular in shape, and 2 × 1 centimetres in length and breadth. After refreshing the edges liberally and making a deep relief-incision on each side, the borders were brought together with five silver sutures. With the exception of a small central fissure, the operation seemed to have succeeded, but on the eighth day a hard mass of fæces was driven down into the rectum, and all the sutures gave way. This left the fistula larger than before—2·5 × 1·5 centimetres. On attempting to repeat the operation, about a month later, care was taken to prevent accumulation of fæces and flatus in the rectum by bilateral division of the sphincter. The edges were again refreshed, but this time, in spite of deep relief-incisions, they could not be brought together. The operator then bethought himself of certain attempts that had been made by Czerwinsky to close such fistulæ by rolling a fold of the rectal mucous membrane into them, and trying to secure its adhesion by sutures and applications of caustic. Czerwinsky's results had not been very encouraging, but it was remembered that he had sought to unite the unbroken mucous membrane of the rectum to the edge of the fistula. Improving upon this procedure, Mäurer incised the rectal fold longitudinally, and stitched one of its raw edges to the opposite edge of the fistulous opening, using very small sharply-curved needles and delicate silk threads. The retraction of the other edge of the rectal fold left a raw surface upon the anterior wall of the rectum. The formation of a layer of granulations upon this surface was attained by producing constipation and by careful antiseptic irrigations of the rectum through a drainage tube left in it. The first movement of the bowels took place on the twelfth day, and union was found firm. The patient was examined four months afterward, and the recto-vaginal septum was perfect. That portion of the mucous membrane that had been taken from the rectum preserved its bright-red color, contrasting sharply with the surrounding pale mucous membrane of the vagina.

19. Mr. Atlee relates two cases of *menstrual retention from imperforate hymen*, and thinks that the condition is very rare, and also that, with two exceptions, systematic writers, in the English language, on surgery and the diseases of women either altogether ignore it or else very imperfectly appreciate and describe it. [Had the cases reported by Mr. Atlee been of the grave sort, with distension of the uterus and the Fallopian tubes, they would have borne directly upon two practical questions: is it advisable to make the opening at any particular time? and is after-treatment necessary?—for both patients did well, although apparently these considerations were disregarded.]

20. Dr. Lemmon's case of *death from a vaginal injection* was that of a woman who, some six weeks after delivery, while stooping over a basin containing an infusion of oak-bark, and using an ordinary Davidson syringe, was suddenly seized with violent cramp-like pains in the lower part of the abdomen, and had to be assisted to bed. "She believed the nozzle of the syringe had entered the mouth of the womb." The inflamed state of the parts precluded a satisfactory local examination when the author saw her, the next day, but there was severe pain over the whole abdomen, tympanites, great gastro-intestinal irritation, and diarrhœa. The thighs were flexed on the abdomen, the pulse was 135, the breathing was labored, there was a pinched appearance of the countenance, the extremities were cold, and the body was bathed in a cool, clammy sweat. The patient died in collapse four days afterward. The author regarded the case as one of septic fever, with general peritonitis and metritis, precipitated by some of the injected fluid entering the uterine cavity.

21. Dr. Bell's *treatment of uterine displacements* consists in the use of tampons soaked in the following solution: alum, 10 parts; carbolic acid, 1¼ parts; glycerine, 80 parts. The tampons are allowed to remain in the vagina three or four days, and when one is removed it is replaced by another. The author has treated some two hundred cases in this way, including those of all sorts, and reports most favorable results.

27. The following *modification of Le Fort's operation for prolapsus uteri* has proved successful in three cases in the hands of M. Eustache: (1) the denudation is carried to the extent of 4 centimetres in width, instead of 1 or 2 centimetres; (2) catgut is used for the sutures, instead of silver wire.

28. Dr. Gervis thus speaks of *a modification of Hodge's pessary* that he has invented: "In all the Hodge's pessaries with which I am familiar, the sacral end, which supports the fundus uteri, is more or less rounded. The result is a constant tendency on the part of the fundus uteri when resting on it to slip to one or other side. The posterior aspect of the fundus being rounded, and the pessary rounded also, it can only give the uterus support at the point of contact. I have therefore had the sacral or upper cross-bar of the pessary made with a central depression, the convexity looking downward instead of upward. On this the uterus securely rests; and, while a steady, equable pressure is thus maintained by the pessary on the fundus, all lateral shifting of the instrument is obviated." [If retroversion pessaries really acted by making pressure on the body of the uterus (which is, we presume, what the author means when he says "fundus"), the phenomenon mentioned by him might occur. If so, it would doubtless have been discovered by others before him, which, so far as we know, is not the case.]

29. According to M. Mondot, *amputation of the cervix uteri with the écraseur* should not be performed for cancer unless there is a clear space of healthy tissue a centimetre in breadth between the point at which the chain is applied and the insertion of the peritonæum; for the line of section is always at a higher level than that at which the chain was passed, and the larger the cervix the greater is the difference. This explains the accident, that has so often happened, of opening into the peritonæum with the écraseur.

31. Apropos of Dr. Pallen's paper on *laceration of the cervix uteri* ("British Medical Journal," May 14, 21, 1881), Dr. Holland thinks that modern views of the frequency and importance of the lesion require serious and impartial criticism. Thousands of experienced and successful obstetricians in England have never recognized it as a cause of serious hæmorrhage, much less as calling for an immediate complex operation, or as being the occult complement of a chronic invalidism. In his own experience, of over two thousand labors, "three fourths of which were plebeian" [whatever may be the bearing of that statement], no case of cervical laceration has called for anything beyond "a kite-tail temporary plug of dry cotton-wool" in addition to the "usual everyday" resources of cold, quiet, elevation of the pelvis, and bandage. He knows of a case, however, in which post-partum hæmorrhage from a retro-cervical scar killed the patient, in spite of cold, plugging, etc., and he is therefore quite prepared to admit that in such exceptional cases the wound should be closely stitched at once, as advised by Dr. Pallen; and he would prefer this to the alternative of protracted vaginal plugging. In the absence of skilled assistants, however, he thinks the application of Paquelin's cautery, at a dull heat, would answer. Unhealed lacerations, he remarks, present themselves in patients suffering from mid-sacral pain, painful coitus, retarded involution and congestion, with or without displacement, and more or less general invaliding; and Emmet's operation facilitates a return to the normal condition. [He then closes with the stereotyped congratulation of his countrymen upon the comparative infrequency of the lesion in England.] ═══ Mr. Cameron, also moved by Dr. Pallen's article, relates a typical case of dangerous hæmorrhage from a cervical laceration, requiring the application of solid perchloride of iron, and followed by a cellulitis. The latter was treated with the hot vaginal douche, etc., with the happiest result. Mr. Cameron adds the interesting statement that he has known laceration of the cervix to be caused by ovarian tumors diverting the uterus from the normal position [meaning, no doubt, that such traction favored the action of the ordinary causes of laceration].

33. Dr. Van de Warker relates an interesting case of *stenosis of the cervical canal after operation for lacerated cervix.* The operation was performed by Dr. Emmet, and the patient's general health was much improved, but she afterward suffered from dysmenorrhœa. The family physician attempted to dilate the canal, but could not find the os externum. The author now found that the vaginal portion of the cervix had lost its symmetry, that the left side sloped abruptly from the center, as if the left angle had been pared away to the cervico-vaginal junction. It thus presented a shrunken, conical appearance, and nothing like an os externum could be seen. The uterus was retroverted. With a small probe a minute opening was found on the sloping lateral surface, about an eighth of an inch from the end of the cervix. The probe passed in about half an inch and was arrested. The canal was evidently tortuous and surrounded by cicatricial tissue. The probe was followed up with a small knife, and thus, by the alternate use of probe and knife, the os internum was passed with some difficulty. The channel thus formed was then enlarged by bilateral incision. To keep the canal open, an intra-uterine stem was introduced. The author regards this method of treatment as safer than the usual practice of using tents. We may do very nearly what we please with the uterus, he says, provided we do it at once and complete it at one operation.

34. Mekerttschiantz relates two cases of supposed *perforative laceration of the cervix uteri.* One of them came under his own observation, and the other he quotes from a Russian journal. In the latter, the lesion was recognized as an oval perforation of the posterior lip, through which the fœtus was supposed to have been expelled in an abortion. In his own case the laceration extended to the os externum, but its characters led him to suppose that a central perforation had taken place at first, and had afterward been converted into a complete slit of the posterior lip, the fœtus being too large to pass through the opening without causing the additional laceration referred to. Such lacerations, the author thinks, may be due to abnormalities in the tissue of the cervix, to deviations from the normal direction of the expulsive force of labor, to long-continued pressure against the promontory of the sacrum, and the like.

43. Under the name of "Noeggerath's operation" Dr. Nelson treats of *vaginal extirpation of the uterus*, also of various other matters. Among a number of loose statements we find the assertion that total extirpation of the uterus has of late been performed with "an amount of success sufficient to warrant the placing of this operation almost on a basis similar to that now held by ovariotomy" [!].

44. Mr. Wells's article deals with *recent improvements in abdominal myomotomy.* Since his last publication on this subject he has practiced the entire removal of uterine tumors by laparotomy in four instances, and in all of them the patients have done well. [Interesting abstracts of these cases are given.] In three other cases he has made simple exploratory incisions, doing nothing more, as the difficulties of removal appeared very great. One patient died a week after the incision, of peritonitis. The two others were neither better nor worse for the operation. In another case, only part of the tumor could be removed, after emptying a large cyst-like cavity, and the patient died on the third day. In still another case, in which only a projecting outgrowth from the main part of the tumor could be taken away, the patient, who was in an extremely feeble condition before the operation, died on the eighth day. Mr. Wells returns with renewed emphasis to the importance of closing the peritoneal edges of the divided uterine wall, or of the connecting part of the outgrowth, with many sutures; but advises against closing the mucous edges when the uterine cavity is opened, as drainage through the vagina may sometimes be useful. Feeling the want of more effectual means of securing bleeding vessels before dividing them, he has had forceps made similar in form to the one previously described by him ("British Medical Journal," 1879, i, p. 928), but with longer handles and a compressing surface more than an inch in length. With several pairs of such forceps, applied before any tissues are cut through, he remarks, large tumors may be cut away with only very small loss of blood. He feels very hopeful that, by the use of the improved pressure-forceps, the arrest of hæmorrhage will be effected much more easily and completely than before; that suture of the uterine wall will obviate more than one source of danger; and that, by careful attention to all needful antiseptic precautions, the removal of uterine tumors may now be undertaken with a far more confident expectation of a successful result than could reasonably have been entertained a very few years ago.

47. Mr. Hulke has made faithful trial of *Chian turpentine for cancer of the uterus*, as well as for other forms of cancer; and has found it utterly useless. In not a single instance did it appear to exert even a palliative effect.

51. M. Cazin calls attention to the silence of authors in regard to *the relations of umbilical hernia to ovariotomy*, and gives notes of two cases of this sort of hernia occurring in conjunction with ovarian disease. In the first case there were features that rendered an operation unadvisable, and none was attempted. In the second case the hernia was a large one, and, in the operation of ovariotomy, a considerable part of the hernial sac was excised, together with its tegumentary covering. The patient made a good recovery, and her hernia was radically cured. In the lower part of the cicatrix, however, there was some eventration. Seventeen cases of this sort are referred to, six of which were observed by Spencer Wells, four by Kœberlé, and three by Boinet. The author concludes that ordinarily the complication does not aggravate the prognosis of ovariotomy; that excision of the wall of the hernia is to be preferred to the old method of avoiding it, provided it is reducible and free from adhesions; and that adhesions need not be looked upon as formally contra-indicating operative measures.

59. Mr. Tait, in his paper on *oöphorectomy for uterine hæmorrhage*, related thirty-one cases (four ending fatally, and twenty-seven in recovery from the operation), and maintained that for intractable uterine hæmorrhage the operation was quite as justifiable as any of the major operations of surgery. Mere removal of the ovaries, however, was not sufficient to arrest menstruation, but removal of both tubes and ovaries did arrest it at once. So far as some of the cases had gone, the arrest would seem to be permanent. Three of them at least, and probably two others, showed that the arrest of menstruation by this means led or must lead to atrophy of the tumor. Finally, there was some close connection, now pointed out, he thought, for the first time, between myoma with its hæmorrhages and cystic disease of the ovaries. In two of the cases the cystic disease seemed to be the cause of the hæmorrhage, without any myoma intervening.

QUARTERLY REPORT ON GENERAL MEDICINE.*

No. VII.

By W. H. KATZENBACH, M. D.,

ATTENDING PHYSICIAN FOR DISEASES OF THE CHEST TO THE OUT-DOOR DEPARTMENT OF BELLEVUE HOSPITAL.

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16. Dr. Riess advocates *the use of prolonged lukewarm baths in the treatment of fevers*, especially typhoid, which he has found more efficacious than the old plan of cold baths. During the past year he has treated one hundred and ninety-five cases of typhoid fever by this plan, with a mortality of eight per cent. (16 out of 195); only two patients died of uncomplicated fever, the rest having severe complications. The temperature of the bath was 25° R. [about

88° F.], and the patient was kept continuously in it on the first day of this treatment, provided the temperature did not fall too low in the rectum, say 96·4°; from the second day on, the duration of the bath was in proportion to the height of the body temperature, the patient usually being removed from the bath when his rectal temperature was 99·5°, and replaced when it was 101°. All patients who had not reached the end of the second week of the fever were so treated, and Dr. Riess knows of no contra-indication to this method. He claims that the patients all enjoyed their bath, and that brain symptoms were most favorably acted on, delirium and deep somnolence disappearing, and convalescence setting in early, and being rapid. Besides typhoid fever, he has treated typhus fever, pneumonia, acute miliary tuberculosis, and variola on the same plan, and with good results. As to the arrangement of the bath, it is very simple, the patient being laid upon a cloth hammock suspended in an ordinary bath-tub, with a ring-shaped rubber air-cushion for a pillow, a woolen cloth being thrown over the whole to keep in the heat.

17. Dr. Ashby is of the opinion that *typhoid fever in children* is of much more frequent occurrence than is generally supposed, and that it very frequently spreads by contagion in the crowded homes of the poor. The typhoid of children more often aborts—that is, runs a course of two weeks instead of three or four—than the typhoid of adults. That such cases are in reality typhoid in character may be known from the presence of spots, rounded abdomen, remittent temperature, etc., and their occurrence in houses where undoubted cases have recently occurred. In other cases the temperature is characterized by well-marked remissions of three or even four degrees all through their course, but more especially after the middle of the second week. Such patients are rarely acutely ill; as a rule, there is not much diarrhœa, relapses do not occur, and recovery is favorable. On the other hand, cases will occur as severe, and accompanied by as much weakness and prostration, as any that may be seen in adults. Cases, with temperature charts, representing each of these varieties, are reported. The author analyzes the mode of onset, and the most prominent features of the disease, as exhibited in fifty cases, and reports cases to illustrate the morbid anatomy. As to treatment, he says that in the majority of the cases no medicine was given. Quinine, salicylate of sodium, and salicin, were all given with advantage in lowering the temperature when it continued high, but the various methods of cooling were generally trusted to to reduce temperature, such as the graduated bath, sponging, ice to the abdomen and head, or the cold pack. Troublesome diarrhœa was relieved by pulv. kino comp., catechu, and chalk or bismuth. The invariable diet was milk — two, three, or more pints daily, according to age.

27. Dr. Boissarie reports a remarkable epidemic occurring in his practice, and names it *diphtheria without sore throat*, an epidemic of diphtheritic paralysis. During an epidemic of diphtheria of somewhat virulent type he met with a series of cases of paralysis, both of the fauces and of the limbs, confined to two adjoining houses, and marked by no other symptom than paralysis, though in a few cases well-marked diphtheritic angina followed the paralysis. The paralysis came on quite rapidly, sometimes preceded for a few hours by malaise, and out of eleven patients, five died. He thinks that these cases can not be accounted for on any other supposition than that of diphtheritic infection, and likens the absence of all throat symptoms to the absence of rash in some cases of the eruptive fevers. However, he does not consider that his diagnosis is absolute.

28. Dr. Whittaker has followed the plan of *topical treatment of diphtheria* in nineteen successive cases, "every one of which improved from the first application, and no one of which showed any bad effects." He takes the ground that diphtheria is at first wholly and exclusively a local disease, the blood and the whole body afterward becoming affected. In the vast majority of cases the poison does not pass the epithelium for a certain length of time, and when it does pass, it passes little by little into the blood until the latter becomes supersaturated with the disease. The true treatment of diphtheria is, first, the destruction of the poison at the seat of the disease, or, if that can not be effected, the condensation of the mucous membrane to such a degree as to make it a dam to any influx to the blood. To accomplish this, the author employs throughout the disease the solution of the subsulphate of iron, the application being made with a brush, "which is passed up behind the velum palati, where it is squeezed out by the powerful contractions of the palatal muscles before withdrawal." The application is not painful, and tolerance is soon established. The brush entangles shreds and patches of membrane, and removes them. The application is to be made once a day, in the morning, before breakfast. In the worst cases, he "applied it morning and evening—never oftener." The author regards the administration of the benzoates and of alcohol in as large doses as may be borne as the proper internal treatment of this disease.

32. The causes of *stertorous breathing in apoplexy* are mechanical, and can at all times be so changed as to alter the nature of a case altogether, and often to make the difference of recovery or death. Stertor is, in one sense, apoplexy *plus* suffocation. Suffocation, added to a grave mischief in the brain, must of necessity affect not merely the symptoms and progress of cases, but also their mortality. As a point of management in cases of apoplexy, it is necessary to keep the patient on one side, and not to change it. Healthy persons, when lying on the side, breathe chiefly with that side which is uppermost, for the intercostal and other thoracic muscles of the lower side are fixed between the weight of the body and the bed, and the breathing of this side is almost entirely diaphragmatic. It must be remembered, too, that in placing the paralyzed side downward, the injured side of the brain is upward, and, therefore, relieved from hypostatic congestion—a condition always liable to occur when an injured part remains dependent. The author cites cases to show the efficacy of this method of relieving stertor, and says that these principles apply not only to apoplexy, but also to all apoplectic conditions, especially drowning, epilepsy, convulsions in children, meningitis with effusion, death rattles, fracture of the skull, concussion, bronchitis (especially that of old people), sudden œdema of the lungs, copious hæmorrhage from the lungs, great exhaustion, chloroform poisoning, and all conditions in which mucus or fluid exists in the lungs; and also all conditions allied to the apoplectic, whether there be mucus or not. He has seen and treated all these conditions, and invariably with a similar result—an unfailing relief to the distressing symptoms and their consequences; and in many instances ultimate recovery has occurred in cases which must, he believes, have terminated fatally if the obstruction to the breathing had been allowed to continue unrelieved.

41. M. Lamarre reports two cases of the favorable action of *nerve-stretching in spinal disease*, supposed to be cancerous affections of the membranes, causing intense sciatica. In both cases there was alleviation of the pain.

44. M. Pommay gives the following *résumé* of his study of *gastric epilepsy:* 1. Troubles of digestion produce various nervous symptoms due to either paralysis or excitation of the pneumogastric nerve. 2. These phenomena are of reflex origin, and show themselves entirely in the sphere of that nerve. 3. The phenomena of excitation manifest themselves in epileptic attacks, while those of paralysis produce precipitate and irregular action of the heart. 4. The age and habitual health of the subject seem to exert an influence upon the mode of response to the irritation. 5. Gastric epilepsy differs from other epilepsy: (a) as to the cause, errors of diet; (b) the symptoms, alimentary vomiting, added to the ordinary symptoms of the attacks; (c) the after-effect, gastric derangement.

58. *Death in pneumonia* is due in the majority of instances to insufficiency of the heart. Dr. Loomis reviews the opinions of authorities as to the cause of this insufficiency, and gives as his own opinion that "in a large proportion of cases it can only be accounted for satisfactorily on the basis of a defective nerve supply to the heart. This nerve failure may be due to the presence in pneumonia of a morbific agent (as in certain infectious diseases), which so acts upon the nerve-centers which supply the heart that its contractile power is diminished and its rhythm disturbed. In a certain proportion of cases there undoubtedly exists, prior to the occurrence of the pneumonia, a weakened or perverted condition of the nervous system (such as is met with in chronic alcoholism, in chronic uræmia, and in the old and feeble), in which the cardiac nerve-supply is easily disturbed, and, consequently, the signs of heart failure appear early and are excessive. Taking the ground that the failure of nerve-power may show itself at the very onset of a pneumonia, and that the heart may begin to stagger at the very commencement of the attack, it is evident that the effect of the local pneumonic changes is to increase the elements of heart failure; for the pneumonic consolidation causes an increased resistance to the pulmonary circulation, and consequently calls for increased power on the part of the right ventricle. Then the surface over which the blood and air come in contact in the lungs is diminished by the pneumonic exudation, and yet another cause of obstruction to the pulmonary circulation is developed. Again, fever induces increased labor on the part of the heart. Thus, from all sides, the heart is the organ upon which the burden of the obstructed pulmonary circulation is thrown. If, in addition to these obstructions of the pulmonary circulation from the pneumonic infiltration, there shall occur a crippling of the heart from endocardial or pericardial inflammation, or if extensive pleuritic inflammation shall restrict the respiratory movements, the chances of early and fatal heart failure are greatly increased." "It is important to detect the first signs of commencing heart failure. Intermission, or even mere irregularity in the filling of the arteries, are far more important indications of a dangerous heart failure, especially if attended by an entire loss or marked feebleness of the muscular element of the first sound of the heart, than a rapid pulse." To "overcome or mitigate the impression made upon the nervous system by the morbific agent which is operating to produce the pneumonia," the author brings his patient "under the full influence of opium at the onset of the disease, and holds him in a condition of comparative comfort until the pneumonic infiltration is completed (usually for the first four days). After this period the greatest care must be exercised in its dose, for now paralysis of the bronchi, and consequent accumulation of secretion in the bronchial tubes, threatens, which will greatly increase the difficulties of respiration. But in the developing period morphia hypodermically seems to lessen the nervous shock, and to diminish or prevent the effect of the pneumonic poison on the nervous system until the first violence of the poison has been spent in completing the pulmonary infiltration. This does not interfere with the usual antipyretic treatment of the disease, nor does a demand for alcoholic stimulants contra-indicate its use." The author is convinced, from results which have followed this plan of treatment, that it greatly diminishes the chance of heart failure; and cases which, from the age of the patient and the attending circumstances, seemed hopeless, have recovered.

69. Dr. Cook says that a patient suffers from *orthopnœa:* First, when he can not fully inflate his lungs from causes such as these: (a) Fluid in the pleural cavity, air in the pleural cavity, fluid in the air-cells and smaller tubes, consolidation of the lung, pneumonic and phthisical (though the condition in these is rarely met with); (b) asthma, stenosis of the glottis from œdema or other causes, emphysema; (c) abnormal fullness of the abdomen preventing the descent of the diaphragm, ascites, tympanites, and enlarged liver and spleen. Secondly, from failing circulation, though this is not so clear and pronounced a cause, (a) from inefficient action of the heart from thinned or degenerated walls, from inefficient valves, from stenosis of its orifices; (b) from fluid in the pericardium; (c) from aneurism or from tumors in the thoracic cavity. In all these cases, the essential condition which gives rise to the orthopnœa is failure of, or imperfection in, the oxygenation of the blood, and, consequently, the circulation of impure blood through the nervous system. This, so long as the nervous system is still sensible of the injury done it, incites the patient to make efforts to relieve the circulation of blood through the lungs. When the nervous system becomes oblivious to this circulation of impure blood, the patient gives up the struggle and assumes the recumbent posture. Four cases of orthopnœa are detailed to illustrate some of the conditions which give rise to this state, and the author enters upon the answer to the question, why the "sitting posture is essential to the successful performance of respiration in these cases." In cases of ascites the erect posture acts mechanically in relieving the diaphragm from pressure by the fluid in the abdominal cavity, which, gravitating downward, freeing the upper portion of the cavity, and permitting the descent of the diaphragm, renders respiration more easy. In cases where the dropsy is more general, with fluid in the pleural sac, in the lung tissue, in the pericardium, and, perhaps, in the mediastinum, the relief is also probably mechanical by the sitting posture. The abdominal organs gravitate downward, and press less upon the diaphragm. Further, it is probable that the prone posture interferes to some extent with the easy expansion of the thorax, and there is in this position a total loss of any advantage which might be gained by fixing the shoulders and arms—an advantage which is instinctively made the most of by patients suffering from asthma. In those cases of orthopnœa dependent on diseases of the heart or aorta the cause must be looked for in the condition of the arterial system. From experiments with the sphygmograph, tracings being made in different postures of the body, the author obtained these results: The diminished amplitude of trace from the lying to the standing position, evidencing very clearly and distinctly the increased tone of the artery in the latter as compared with the former position, with lessened expansion under the charge of blood sent into it by the systole of the left ventricle; the coats of the artery exerting more resistance to the expansive force of the blood current. Under such conditions the force with which the blood reaches the capillaries, and the rapidity of the current, are both lessened in the recumbent posture. The tone of the arterial system being depressed, it follows that the circulation of the blood through the capillaries, and thence through the nervous system, will be less active; a condition of comparative stasis both in the pulmonic and systemic circulation will be favored, and venous congestion increased. Further, as the circulation of arterialized blood fails, the tissue respiration is less perfectly performed, and that *besoin de respirer* begins to be felt which is the essence of the distress that forms so large a portion of dyspnœa. In health this diminished tone of the arterial system set up by change of posture is of comparatively little moment; but in diseased conditions of the heart and lungs, when very little aid on the one hand, or increased difficulty on the other, is of vast importance, it may assume a character which makes it a chief factor in the condition which is being considered. This explanation affords indications for treatment. First, as regards the purely mechanical difficulties chiefly referable to obstruction of the respiration, and possibly of the circulation, by fluid in the cavities. Here free purgation by hydragogue cathartics is followed by good results in removing the fluid rapidly and effectually. In those cases where the physiological phenomenon is one of diminished tone of the arterial system, those remedies are effectual which are calculated to influence this condition, and through it the respiratory system. Digitalis does this. Strychnia combined with digitalis seems to influence the contractile power of the unstriped muscular fibers of the vessels. The hourly administration of digitalis and nux vomica in small doses seemed to have the best effect in the cases quoted in the paper.

81. Dr. Fenwick's paper on *tricuspid stenosis* is quite lengthy. From the facts which he presents, the following conclusions are deduced: 1. Tricuspid stenosis is not so rare as it is generally believed to be. 2. It attacks women far more frequently than men, in the proportion, perhaps, of about eight to one. 3. Death rarely results from it before the age of twenty or after that of fifty, and it most commonly occurs between twenty and thirty, the number of its victims steadily diminishing thereafter with each semi-decade. 4. In fifty per cent. of the cases there is a well-marked history of antecedent acute or subacute rheumatism. 5. In every case the mitral orifice is also narrowed, and generally to a greater degree than the tricuspid. 6. The right auricle is more or less dilated in every case. 7. In 56·5 per cent. of the cases the aortic valves are also diseased, and in about 26 per cent. of the cases the orifice is narrowed. 8. Tricuspid stenosis, when found in adults, is due to acquired disease, and probably is never of congenital origin.

84. In his remarks on *deviations from the normal arterial tension associated with certain diseases of the kidneys and heart, and their treatment*, Dr. Anderson says that "the chief value of the sphygmograph at the bedside is to enable us to gauge the degree of tension, and to register from time to time its variations more accurately than can be done with the finger. High tension is to be relieved by removing the cause. Thus, in acute Bright's disease it is principally due to the diminished urine; and, accordingly, if we succeed in inducing profuse urination, the high tension, as well as the other symptoms, disappears. In chronic Bright's disease, on the other hand, there is often excessive urination, and yet the tension is high, the cause being the stop-cock action of the arterioles throughout the system on the one hand, and the overaction of the frequently hypertrophied left ventricle on the other. In such cases, though we may not be able to remove the chronic disease, yet we can often diminish the tension, and thus may avert threatened complications—cerebral hæmorrhage, for example. This is to be done: 1. By stimulating the organs of excretion. 2. By the administration of medicines which directly lower the tension. The latter are of use, not only with the view of controlling kidney, but also heart complications, such as angina pectoris. 1. Nitrite of amyl lowers the tension and controls angina pectoris. 2. Nitroglycerine acts more slowly than amyl, but its action is probably more permanently beneficial. A one-per-cent. solution in spirit is used in from one-, cautiously increasing up to fifteen-, drop doses every three hours. When the tension is unduly low, this may sometimes be rectified: 1. By support and stimulation. 2. By the administration of medicines which directly raise the tension. These are digitalis and casca, the latter in the form of tincture, of the strength of 1 to 10, in five- to ten-minim doses three times a day."

QUARTERLY REPORT ON MATERIA MEDICA, THERAPEUTICS, AND TOXICOLOGY.

No. VI.

By GASPAR GRISWOLD, M. D.

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66. Kirk, R.—Notes on a case of poisoning by carbolic acid. "Glasgow Med. Jour.," June, 1881.

6. M. Yvon, as a result of experiments upon himself, arrives at the following conclusions in regard to *the absorption and elimination of saline purgatives:* 1. Sulphate of magnesium, taken by the mouth, is not absorbed without having undergone some modification in the alimentary canal. A large part of the magnesia is precipitated as an insoluble oxide, while the sulphuric acid in combination with it is absorbed and is excreted by the kidneys in the form of sulphates. 2. The elimination is immediate, the excreta showing no trace of medication after twenty-four hours. 3. The amount of urine is diminished as a result of transudation into the intestine. 4. The administration of sulphur causes increase in the amount of urine, as well as purgation. 5. If sulphate of magnesium and sulphur be simultaneously administered, absorption of the sulphur still takes place, but is reduced to about one third.

9. The author considered it strange that, while iodine, bromine, and chlorine were so much used in medicine, no attention seemed to have been paid to *fluorine*, the remaining member of the group. This reasoning led him to have salts of fluorine made, to experiment with; the purest attainable hydrofluoric acid was employed, and salts prepared with potassium, sodium, and iron. *Potassium fluoride* is deliquescent, soluble in three parts of water, insoluble in alcohol, and has a not disagreeable saline taste. Its concentrated solution dims glass. *Sodium fluoride* is soluble in twenty-five parts of water, almost insoluble in alcohol, with a saline taste. The solution is so weak that it dims glass only slightly after long standing. *Ferrous* and *ferric fluorides* were made; the former is preferred on account of its greater solubility (1–8 water). From these salts, especially the *potassium fluoride* and *ferrous fluoride*, various preparations were made: elixirs with rectified spirit and oil of bitter orange and of cinnamon; or syrups, with syrup of orange flowers, etc. Potassium fluoride was first given in a case of subacute rheumatism, with considerable pain, in doses of five grains every three hours. It produced a most decided effect upon the pain without, however, causing drowsiness or influencing the temperature. The urine was increased, and its specific gravity was lowered; but this may have been due to an increased amount of water drunk on account of thirst attending the gastric disturbance caused by the drug. At the end of the second day there was nausea, with loss of appetite, and the medicine was discontinued. The pains returned; at the patient's request, a few days afterward, the treatment was resumed with the same good effect upon the pain, but causing so much nausea, etc., as to necessitate its discontinuance. In other cases of rheumatism, more or less acute, similar results were obtained; and in a case of sciatica pain was diminished, but vomiting occurred very soon. The fluoride of potassium, then, is anodyne, without causing drowsiness or affecting the pulse, respiration, or temperature. It soon causes such digestive disturbance as to require its discontinuance. In doses of ten grains it is promptly emetic, causing very little nausea or depression. A saturated solution, applied to the skin, seems devoid of irritating properties. The iron and sodium salts are even more apt to excite stomach disturbance than potassium fluoride. It will be seen from these observations that the unpleasant effects of the fluorides, in all probability, more than counterbalance the advantages to be derived from their use. [In an article by Woakes, in the "Lancet" for April 2, 1881, is described a very successful treatment of goître with a one-in-two-hundred solution of pure fluoric acid, administered in fifteen- to thirty-minim doses three times daily.]

16. M. Kaufmann has arrived at the following conclusions with reference to *the rapid action of the heart which follows toxic doses of digitalis:* He administers digitaline to a dog until the primary slowing of the heart has given way to the subsequent acceleration; he then cuts the pneumogastrics. No further acceleration of the heart's action follows this operation, showing that the pneumogastrics at the time of section were exercising no inhibitory influence upon the heart. He then galvanizes the peripheral extremities of the cut nerves, but can not thereby produce any reduction of the rate; he therefore infers that the peripheral ends are paralyzed. He believes, then, that digitalis first stimulates the pneumogastrics, slowing the heart; at a later period, and in larger doses, it paralyzes the peripheral ends of the pneumogastrics, the heart beating rapidly in consequence of all inhibitory influence being removed. The author also states that the development of rapid action and the paralysis of the pneumogastrics go hand in hand; that is, the action is never very rapid until the nerves are paralyzed, and, *vice versa*, the nerves are never paralyzed without the simultaneous occurrence of rapid action. [It seems proper to state here that the generally accepted explanation of the rapid action of the heart in digitalis poisoning is as follows: The direct stimulation of the cardiac muscle caused by digitalis in cases of poisoning finally results in a permanent tetanic contraction of the ventricles, diastole no longer occurring, and the heart being found in systole after death. This tetanic contraction shows itself first at the apices of the ventricles, progressing toward the base; so the cavity of the ventricles is gradually obliterated from the apex toward the base; when the obliteration has reached the base, there is no longer any ventricular cavity, the heart has stopped in systole. By degrees, as the ventricular cavity diminishes in size, the heart beats more and more rapidly to drive along the blood, the diastole being short and imperfect. This has been again and again observed by competent authorities; the author does not allude to it in his paper.]

17. Dr. Wood first notices the direct stimulation of the heart muscle by *digitalis*, in addition to the steadying influence which the drug exerts upon it through the pneumogastrics. This steadying influence facilitates the nutrition of the heart substance, which is interfered with in rapid and irregular action of the organ. The author then submits that digitalis is often improperly used in aneurism, where it does harm by increasing arterial tension. It should not be given early in pneumonia, in the sthenic stage; but is indicated when the heart begins to fail, later on. Digitalis acts slowly and cumulatively because it comes in contact with the heart structure only very slowly, and "osmoses" slowly into and out from the body. When it fails to act upon the kidneys it is more apt to act cumulatively upon the heart. The longer digitalis takes to act, the longer its effect will last. After abdominal tapping, digitalis often acts suddenly upon the heart. In syncope or collapse, or surgical shock, we may give twenty minims of the tincture at once and expect to see results in half an hour; no irritation is produced at the point of puncture. The infusion is generally preferred, probably because it is usually given in larger doses than the tincture. Half an ounce of the infusion corresponds in strength to half a drachm of the tincture; probably a good tincture is as efficacious in comparative doses as a good infusion. With regard to digitaline, it is not the alkaloid, but merely a purified extract; it is uncertain in its composition and results. Dr. Wood has not used it. He discountenances large doses of digitalis until smaller ones have been tried. Digitalis usually kills with the heart in systole; in rare cases the action upon the pneumogastrics may predominate, the heart stopping in diastole—*in such a case life might be restored by cutting the pneumogastric* [!]. The pulse becomes frequent in digitalis poisoning because the ventricular cavities are so constricted by tetanic contraction of their walls that the blood can not pass on. [In spite of Dr. Wood's high authority to the contrary, there is in the market the crystallized digitaline of Merck, claimed to be the alkaloid, and certainly efficient in the dose of $\frac{1}{50}$ of a grain.]

20. Dr. Seguin sums up as follows the experience of all observers with reference to *the physiological and therapeutical effects of hyoscyamia:* 1. It acts as a mydriatic, but whether more fully or longer than atropia remains to be settled. 2. In small doses it reduces the cardiac pulsations, increases arterial tension, and checks the loss of body heat. It also produces hallucinations and delirium. It may cause a fall of axillary temperature, and occasionally a rash. 3. In large doses it immediately increases the pulse rate, produces a seeming paralysis or motor debility, and sleep. 4. Hyoscyamia is indicated in mania, restlessness, delusions of persecution, dementia with agitation and destructiveness, epileptic mania, insomnia, rapid action of the heart, epilepsy (?), status epilepticus, chorea, paralysis agitans, hysterical spasms, neuralgia, tremor, etc. 5. In mania and allied states it produces sleep as certainly, or even more certainly, than chloral, without any bad after-effect, unless it be occasional gastric disorder. 6. In cases of delusions of persecution or suspicion it has produced a positive cure. 7. In paralysis agitans it achieves what no other remedy has ever done—viz., arrests the movements for four hours or more without insensibility. 8. In the status epilepticus it shortens the attack materially; perhaps better than any other single remedy. 9. It is a diuretic of no mean powers. 10. The curative power of hyoscyamia does not appear to be great. In some cases of insanity its use has been followed by recovery, but, as a rule, we must look upon it as a narcotic, often speedier, more complete, and less objectionable than morphia and chloral hydrate. 11. In spasmodic diseases we can, so far, speak of hyoscyamia only as a palliative or ameliorating agent. The author uses the following solution hypodermically: ℞ Hyoscyamiæ (Merck's crystallized), gr. ij; glycerinæ, aquæ destill., āā, ♏ c; acid. carbolic., gr. ss. Filtra. Sig. ♏ j=gr. $\frac{1}{200}$. Two minims, a moderate dose; four minims, a full dose. The paper also contains histories of several cases of chorea and paralysis agitans treated with hyoscyamia.

21. Dr. Coghill is strongly in favor of *inhalations in phthisis.* He uses a metallic mouth-piece, covering the mouth, and held in place by elastic loops which fit over the ears. The center of the mouth-piece is double, both plates being cribriform; between them is a cavity containing a piece of tow large enough to hold twenty drops of the solution to be employed. The following formula is a favorite with the author: ℞ Tinct. iodinii ætherialis, acid. carbolic., āā, ʒ ij; creasoti, vel thymoli, ʒ ij; alcohol. ad ℥ j. Where cough is urgent, ether or chloroform may be added at discretion to this mixture. Ten or twenty drops of the solution are poured upon the tow, the mouth-piece is applied, and the patient is directed to breathe in through the mouth and out through the nose. The length of time during which inhalations should be persisted in may safely be left to the patient, guided by his own sensations. In this way cough mixtures are largely done away with, and the stomach is spared for its own work.

25. Dr. Hamilton thinks highly of *the treatment of phthisis with inhalations of carbolic acid.* He does not like the various forms of inhalers, etc., considering that they supply the acid in too concentrated a form. He employs by preference simple Lister's carbolized gauze, moistened occasionally with an aqueous solution of carbolic acid. A piece of gauze may be worn a short distance in front of the mouth. The author is confident that convenient forms of such apparatus will soon be invented, and feels sure that the suppurating surfaces in the lung will be most favorably affected by the treatment.

28. When Dr. Bogusz and Professor Ostroumow originally proposed the *benzoate of sodium as a specific in diphtheria*, they reported 121 cases, in all of which the patients recovered under a treatment of benzoate of sodium alone internally, and benzoate of sodium and chloral hydrate by inhalation. These 121 cases were reported to have been of even more than ordinary severity; a number were of the so-called septic form of diphtheria, and not a few were complicated with croupous laryngitis. Since all the patients recovered, the inference was unavoidable that the agent employed was a specific. The result of this communication was great excitement, and the author eagerly availed himself of the opportunity to take charge of a children's hospital, and see for himself the action of the new treatment. During five weeks he received into the hospital 14 patients with diphtheria; 2 of these died immediately after admission; 4 were treated by the ordinary method (carbolic acid locally, quinine and stimulants internally), and all recovered; the remaining 8, along with 2 cases in the author's private practice—in all 10 patients—were treated with benzoate of sodium, as follows: A solution of benzoate of sodium in water (ʒ j— ℥ j) was sprayed into the mouth and throat every hour or half-hour; ʒ j of chloral hydrate was added to this solution early in the disease, omitted later on. Internally, the benzoate of sodium was administered in the following mixture: ℞ Sodii benzoat., ℥ ss; aq. destill., ℥ j; ol. menth. pip., gtt. x; syr. aurant. cort., ʒ ss. Sig. Hourly as ordered. The dose per diem, according to Bogusz, is, from 1 to 2 years, ʒ j; half a drachm more for every year until ℥ j is reached. Of the 10 cases treated, 7 were idiopathic, 3 scarlatinal. One of the scarlatina patients died; 5 of those with idiopathic diphtheria died. Full histories are given. The author concludes: 1. That the benzoate is *not* a specific; in septic cases it does not prevent blood poisoning; in mild cases it does not keep the disease from spreading, or prevent involvement of the larynx. 2. It does *not* clearly assist the separation of membrane and clearing up of the throat in simple cases. 3. Its antipyretic action is uncertain and difficult of substantiation; at any rate, fever is not an important factor in diphtheria mortality. The author considers it a safe treatment, as regards heart depression, effect upon the alimentary tract, etc., but does not consider that the addition of it to the therapeutics of diphtheria is a sufficient advance to justify any enthusiasm.

32. Dr. Groner has used *jaborandi in parotitis* in six cases, in one of which he was himself the patient. He believes that the early use of a sufficiently large dose of the fluid extract of jaborandi to cause considerable diaphoresis and ptyalism in most cases acts as a specific, and aborts the disease. He sometimes combines the administration of ten or fifteen grains of quinine at the commencement of the treatment.

35. M. Hallopeau has employed and recommends the following method in the *treatment of erysipelas with salicylate of sodium:* 1. Application to the part of compresses wet with a solution of salicylate of sodium (1–20), covered with oiled silk, and frequently renewed; 2. Internal administration daily of four grammes (ʒ j) of the salicylate, in three doses, in weak grog. M. Bochefontaine's experiments have shown that, if to a joint be applied compresses wet in a solution of salicylate of sodium (1–20) and covered with oiled silk, the drug will soon appear in the urine. The results of this treatment, observed in twelve cases, were as follows: 1. The temperature was undoubtedly lowered in those cases which presented marked febrile disturbance. 2. In most cases the duration of the disease was much abridged, judging from the statement of Velpeau, that twelve days is the usual course. In several cases the disease seemed quite promptly controlled. 3. Up to the present time the author has not observed the accidents which have occurred within his knowledge in typhoid-fever patients taking the same doses of the remedy. In one case there was slight temporary delirium, which may not, however, have been due to the medicine. The author recommends suspension of salicylic-acid treatment in this and other diseases as soon as cerebral disturbance or dyspnœa makes its appearance.

37. Korn praises highly the use of *chloral hydrate in the local treatment of diphtheria.* He employs a solution in glycerine, fifteen to thirty per cent., according to the age of the patient. The glycerine covers the taste of the chloral, and makes a solution of proper consistence for painting upon the diseased surfaces with a camel's-hair pencil. It relieves the pain and difficulty in swallowing, retards the formation of new membrane, breaks up and loosens the membrane already existing, and, acting as a disinfectant and antiseptic, prevents septic infection of the system at large. The solution quoted above should be applied to the throat every second hour, the patient being roused in the night for its administration in bad cases. In the worst cases the membrane altogether disappears in three or four days, and healthy granulation rapidly progresses. The application is not painful; Rokitansky has employed a fifty-per-cent. solution, causing some pain in sensitive patients.

42. Kurz complains that *the faradaic current* is far too little used in general practice, and submits the following clinical memoranda with a view to raising the agent to its proper position among therapeutic resources. Case I.—An unmarried woman of thirty, suffering from neuralgia of the anterior crural. The patient, who had in addition retroflexion of the uterus, had suffered for a month from pains shooting along the inner side of the left thigh, and slight paresis of the corresponding muscles. The primary current, weak on account of the nervous excitability of the patient, was applied for fifteen minutes, the positive electrode being kept stationary over the lumbar plexus, and the negative moved along the course of the affected nerve. The patient was too sensitive to bear the wire brush. Entire recovery took place after twenty sittings. Case II.—A woman, in the seventh month of pregnancy. To bring on premature labor faradization was employed on two successive days, three sittings daily of twenty minutes' each. A powerful primary current was passed through the uterus, and contractions were caused during the sitting, but ceased afterward. In this case it finally proved necessary to employ in addition warm vaginal douches and the introduction of a catheter into the uterus. Case III.—Very good results followed the treatment of splenic enlargement following intermittent fever. A strong primary current was, during a month and a half, daily passed for fifteen minutes through the spleen. This organ diminished in size to a remarkable degree, and the patient in the mean time experienced marked improvement in general health, appetite, etc. [This case is fully described in the "Dtsch. med. Wochenschr.," No. 29, 1879.] Case VI.—Cervico-brachial neuralgia in a lady of thirty-six. Duration, two days; cause, apparently, change in the weather. Pain in the left side, running up along the neck to the occiput, and along the arm and hand to the finger-tips. Medicines had done no good, and the patient was suffering severely. Daily administration of a strong primary current for twenty minutes (the wire brush during half the time) cured the patient after twelve sittings; the positive electrode was kept stationary in the cervical region, the negative moving over the painful points. Case VII.—Rigidity of right knee, with paresis of right leg, in a lady of twenty-three, following puerperal parametritis six months before. Treatment: warm baths, massage, and daily faradization for twenty minutes. After three sittings the patient threw aside crutches, walking about with a cane, and bearing her weight upon the injured leg. After ten sittings the patient could walk without a cane. After sixteen sittings the patient was far enough recovered to travel with a view to improving her general health. Case XI.—Muscular rheumatism of a year's standing in a man of fifty-eight, affecting the muscles of the back and thigh. Strong primary and secondary currents were alternated. Patient much improved after the first sitting, entirely cured after the fourth. Case XII.—Nocturnal incontinence of urine in a little girl of five. The trouble had lasted from birth, and there was also a tendency to pass water involuntarily during the day. Diagnosis: paresis of the sphincter and anæsthesia of the bladder. Daily faradization; a weak secondary current, for five minutes with the positive electrode upon the perinæum and the negative over the bladder, and for five minutes more with the positive electrode upon the sacrum and the negative upon the dorsal spinal region. The diurnal urinary trouble ceased after the first sitting; the instances of nocturnal incontinence at once became rarer, and after fourteen sittings treatment was discontinued. The recovery was entire and permanent, and must be attributed to the electricity, since no medicines were given; even regulation of diet was not suggested. The other cases were of sciatica, and were more or less favorably affected by treatment.

46. A full description, with illustrations, of *Voltolini's battery*, which combines apparatus for the production of the constant galvanic current, the induced or faradaic current, and electromagnetism. The battery is powerful enough to be used as a cautery and in electrolysis. A fluid is used consisting of one part of bichromate of potassium, one part of strong sulphuric acid, and ten parts of ordinary water; the expense of filling the battery is insignificant. Two sizes of the battery are described; the larger can be carried without inconvenience. The article gives the impression that the battery is simple in construction, portable, and efficient.

51. In this paper on *the care of leeches* Prota-Giurleo (as a result of experiments upon animals) finds that leeches introduced into the stomach, and there producing symptoms of pain, are expelled dead after a dose of santonin has been administered. This may be useful information in a case where a leech has got into the body from being carelessly applied at any of its orifices. The author also directs that leeches, after having been used, be cleansed and disinfected in the following manner before being used in another case: Three aqueous solutions should be prepared: one of camphor (5 : 1,000), one of chloral hydrate (5 : 1,000), and one of carbolic acid (1 : 1,000). Place the leech in each of these solutions, successively; keep it in each solution for ten or fifteen minutes, and, on removing it, strip it between the thumb and index finger toward the mouth, squeezing out as much blood as possible. After this process, the leech may be used again without fear of conveying infection.

52. M. Lancereaux calls attention to *the vaso-motor and trophic disturbances occurring in patients suffering from chronic alcoholism.* He enumerates coldness and cold sweating of the extremities; œdema of the extremities, with no organic lesion to explain it; so-called "local asphyxia," or "syncope of cellular tissue," resulting in dry gangrene of the finger tips, the ends of the toes, or small cutaneous areas; and hæmorrhagic spots of purpuric or ecchymotic appearance. The author considers that these affections when due to alcoholism are characterized by a tendency to attack the extremities symmetrically, and gradually advance toward the center. The author has seen gangrene of all the finger tips, like that due to ergot; he has also observed an area, of the size of a silver dollar, upon the dorsum of both feet, undergo mummification. Mention is also made of neuralgia, and local anæsthesia, following poisoning with carbonic oxide which had proved insufficient to cause death. The author believes these affections to be due to interference with the normal nutrition of the nerves, resulting from the destructive action of carbonic oxide upon the red blood corpuscles.

54. Lesser has written a very long and exhaustive paper upon *the anatomical changes present in cases of poisoning with caustic agents.* He bases his ideas upon experimentation upon animals and an extensive analysis of cases. In the three years (1876–1878) there occurred in Berlin 432 well-authenticated cases of poisoning; of these, 134

(32 per cent.) were poisoned with caustics; and, of these latter 134, acids were the agents employed in 114. In the 432 cases, 155 were poisoned with carbonic oxide, this standing at the head of the list as regards frequency; next comes sulphuric acid, taken in 78 cases. The mortality in cases of caustic poisoning was 47 per cent.; in cases of poisoning with non-caustic agents it was 75 per cent. The mortality in the case of some of the agents employed was as follows: Sulphuric acid, 47 per cent.; phosphorus, 55 per cent.; oxalic acid, or its potash salt, 58 per cent.; arsenic, 75 per cent.; carbonic oxide, 77 per cent.; hydrocyanic acid, 95 per cent. The author mentions that the sensitiveness of the duodenal mucous membrane may admit of its injury by an agent that has passed through the stomach and œsophagus without doing harm. He also states that caustics act very much alike, and takes sulphuric acid as the type. The paper is largely composed of minute and detailed descriptions of lesions, and resists synopsis.

55. In Dr. Macdonald's case of *hydrochloric-acid poisoning*, a powerful and healthy man swallowed by mistake an ounce and a half of hydrochloric acid. The author found him in a condition almost of collapse; there was no corrosion of the mouth or fauces, this being explained by the fact that he had gulped the acid. He had already taken a teaspoonful and a half of bicarbonate of sodium and a bottle of soda-water before the author's arrival, but, as the amount of acid swallowed was so large, he was ordered a solution of the common carbonate, this form being preferred on account of the smaller amount of gas to be evolved while the acid was combining with it in the stomach. A teacupful of the solution was given; the patient was surrounded with hot-water bottles, and directions were given that he should take nothing but milk. The patient had slight fever and some gastric and intestinal irritability for a few days, but was completely restored to health at the end of a fortnight. The interesting point in the case is the evidence it bears to the low corrosive power of hydrochloric acid, and the absence of mouth-signs to aid the diagnosis. ═══ On an extended trial, the author finds *carbolic acid in whooping-cough*, in doses of one fourth minim to a child of six months, one half minim for one of a year, and one minim for one of two years and upward, to be the best remedy. "The whoop goes; the vomiting ceases; the paroxysms are modified in intensity and frequency." This result he believes to "arise from a similar action to that of creasote on the motor fibers of the vagus to the stomach, and from a lowering of the vitality of the specific germ of whooping-cough disease."

56. M. Mignon, in his paper on *artificial respiration for opium poisoning*, describes a case in which a strong, healthy child of six months was given by mistake a teaspoonful of vinum opii (containing six grains of opium). The little patient soon became drowsy and stupid, and, at the time when the author first saw him, was breathing only six times a minute. No emetic was administered, it being considered that sufficient time had elapsed for complete absorption to take place. Coffee with brandy was given freely, and quinine to the amount of fifteen grains was injected into the rectum. In spite of these measures, the child became completely comatose, and finally stopped breathing altogether. Artificial respiration was at once resorted to according to Sylvester's method. The child was rapidly restored, but again became cyanosed as soon as the artificial respiration was intermitted. This was so obvious that preparations were made to continue the operation indefinitely; several friends of the family were called in to assist by taking turns in the work. In this way artificial respiration was kept up for twenty-four hours from the time when it was first resorted to. By that time the child had recovered sufficiently to breathe without assistance, and showed signs of intelligence when its name was called. No relapse occurred, and recovery was complete in two or three days. The author wishes to call especial attention to the fact that in this case artificial respiration seemed quite adequately to take the place of normal respiration for a period of twenty-four hours. He believes that the child would have died if the operation had been suspended for any considerable interval during that period. Artificial respiration is always resorted to in emergencies which call for it, but it is not generally admitted or appreciated that it can continue efficient for so long a time.

60. Dr. Grattan gives the history of a case of *belladonna poisoning treated with pilocarpine* in which the patient, a woman of forty-two, drank by mistake two ounces and two drachms of belladonna liniment. She discovered her mistake and took two teaspoonfuls of mustard in water, but failed to produce emesis. She then walked a short distance and purchased an emetic, which she drank. She then returned home, beginning to feel dizzy, and seeing indistinctly, with shadows before her eyes. She lost the power of speech, became much excited, and ended by having convulsions, vomiting freely, and becoming unconscious. She was seen for the first time by the doctor at 10.45 P. M., six hours after she had taken the poison. The pupils were widely dilated, the face congested and swollen; her pulse was rapid and almost imperceptible, her respirations twenty-five. A stomach-pump was employed, and the stomach was thoroughly washed out with mustard and water. Vomiting occurred again in half an hour, and sensibility began to return, but the patient soon relapsed into stupor, in spite of cold affusions, etc. At 3 A. M., ten hours after the poisoning, one fifth of a grain of pilocarpine was injected hypodermically; this was twice repeated, at intervals of fifteen minutes. After the third dose there was decided improvement; consciousness began to return, and the pulse became stronger. After a fourth dose the pupils began to contract under the influence of light. From this time improvement was rapid. There were dizziness and dilatation of the pupils for two days. Half-drachm doses of laudanum were given every night for three days, when she had entirely recovered. Four fifths of a grain of pilocarpine were given in all. It did not cause the least perspiration or salivation, but seemed to act as a direct antidote to the belladonna.

62. In Dr. Baker's case of *poisoning by bitter almonds* a man thirty-eight years of age took in the evening two handfuls of bitter almonds and a pint of beer, having eaten nothing during the day. About two hours afterward he suddenly became unconscious, and fell down as if in a fit. When seen, he was quite insensible and collapsed; his breathing was gasping and labored; he was cyanotic; and the pulse was hardly perceptible, rapid, and flickering. There was some dark mucus about his mouth; his jaw was fixed, his teeth firmly closed; his pupils were contracted and perfectly insensible to light or touch. The apex beat was feeble; the abdomen was somewhat distended and he had passed fæces involuntarily; some mucous râles were heard over both lungs. The stomach-pump was at once used, and about a pint of dark fluid was removed, containing a quantity of small, white particles smelling strongly of hydrocyanic acid. His stomach was then washed out with warm water. After this the patient became more collapsed, and his radial pulse became almost imperceptible. "The battery was used for ten minutes—*one pole over the apex of the heart, the other on his neck, over the course of the pneumogastric nerve.*" Respiration now improved a little, and the patient was put to bed with hot fomentations upon his chest and abdomen, and hot water to his feet. At 10 P. M. liquor ammoniæ fortior was given by inhalation every ten minutes, and the "*current from twenty-five cells of Leclanché's battery applied as before.*" At midnight the patient remained in about the same state; the ammonia and battery were continued alternately every half-hour until 2 A. M. Hot turpentine stupes were then applied over the chest, and one twenty-fourth of a grain of atropia sulphate was given hypodermically. After this the patient improved; at 5 A. M. he opened his eyes. At 6 P. M. he was entirely recovered, though weak; he was discharged the following morning at his own request. Very few cases of poisoning by bitter almonds are on record. Dr. Taylor reports two, neither of which proved fatal. In this case the symptoms were so marked as to render it probable that a fatal result was only averted by the prompt and vigorous treatment employed. Points of interest are that a considerable interval elapsed between the ingestion of the almonds and the first symptoms of poisoning, and that the latter then came on in the sudden manner characteristic of hydrocyanic-acid poisoning. [Two points in the treatment are worthy of some criticism. In the first place, the use of liquor ammoniæ fortior (containing twenty-six per cent. of ammonia gas), instead of the ordinary aqua ammoniæ (containing ten per cent.), for inhalation. It is always dangerous to administer inhalations of ammonia to an unconscious person, who can, of course, give no sign that the vapor is unduly irritating; cases are on record of œdema of the glottis caused by the ordinary aqua ammoniæ incautiously administered under these circumstances. It is strange that the aqua fortior should

have been used in the present case, unless, indeed, the safer preparation was not at hand. In the second place, and more particularly, the use of the battery betrays some very foggy notions with reference to the physiology of the pneumogastric nerve, or must depend upon some original views of the author not yet published. In his own words, the heart being feeble, "the battery was used for ten minutes, one pole over the apex of the heart, the other on his neck, over the course of the pneumogastric nerve." All physiologists are agreed that stimulation of the pneumogastric causes cardiac depression, considerable stimulation of both nerves, or very forcible stimulation of one, being sufficient to stop the heart in diastole; and this arrest in diastole is permanent, causing immediate death, if the current be strong enough. Nothing could be better calculated to do harm, then, in the case of a man already collapsed, with almost imperceptible pulse and feeble apex beat, than galvanization of the pneumogastric, as was done in the case described. Indeed, the question which at once suggests itself is, Why did not the patient die? Twenty-five cells of a strong battery in good working order should give a strong enough current to stop a heart already enfeebled; it must be a matter of familiar observation to those who have treated cases of exophthalmic goître by galvanization of the pneumogastric in the neck that six or eight cells of an ordinary battery are sufficient to reduce the number of cardiac pulsations from 120 to 90 or 80, and give about as strong a current as the patient can stand without dizziness and faintness. Certainly such a current (always supposing the battery to be in good order) applied to the pneumogastrics of an ordinary dog will kill him instantly, stopping his heart permanently in diastole. Perhaps the patient in the present instance was saved by *paralysis of his pneumogastrics by the hydrocyanic acid which caused his symptoms.* If the pneumogastrics were paralyzed, galvanization of them, while it could do no good, could at the same time exert no depressing influence upon the heart. In aconite poisoning the pneumogastrics are paralyzed, and galvanization of them has no effect upon the heart, no matter how strong the current may be; although no experiments have, so far as we are aware, been made upon the action of hydrocyanic acid upon the pneumogastrics, its action upon other motor nerves would justify us in assuming that it was paralyzing in character. In a case of collapse from chloroform, in which the heart *would be enfeebled without paralysis of the pneumogastrics*, the use of electricity as described would almost surely cause death.]

61. Löbker describes a case of *poisoning by carbolic acid* taken into the stomach, a child having received from its mother a spoonful of carbolized oil (50 per cent.), she mistaking it for castor-oil. The child almost immediately became unconscious, stertorous, and cyanotic. The doctor, being called at once, arrived a very few minutes after the ingestion of the poison. Having no stomach-pump, he introduced an œsophageal sound, poured through it into the stomach the first fluid he could get (some coffee and milk which happened to be in the room). Application of the syphon principle being impossible in the absence of a long flexible tube, the author laid the child upon its abdomen and raised its lower extremities until the contents of the stomach ran out through the sound by mere gravity. By this time a flexible tube which had been sent for arrived, and the process was continued at a better advantage until the water issuing from the stomach no longer smelled of carbolic acid. The child recovered, and, after some gastric disturbance of three or four days' duration, was as well as ever.

QUARTERLY REPORT ON VENEREAL AND GENITO-URINARY DISEASES.

No. VII.

By EDWARD B. BRONSON, M. D.,
PHYSICIAN FOR SKIN AND VENEREAL DISEASES TO THE NEW YORK DISPENSARY.

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1. Mr. Harrison's article on *prostatitis* contains some observations regarding the differential diagnosis of the acute affection which we deem worth quoting in full. He refers particularly to "two conditions which simulate it, one of which," he believes, "has led to the impression that this disease is far more common than it really is. The first is inflammation and suppuration around the membranous portion of the urethra as a consequence of urethritis; and the second, inflammation and plugging of the veins constituting the prostatic plexus. I have seen," he says, "many instances of the former where inflammation and suppuration around the membranous urethra have led practitioners into the belief that the case was one of metastasis of the gonorrhœal inflammation from the urethra to the prostate gland. And the points of resemblance are by no means isolated—there is, in fact, a remarkable likeness between the two conditions. In both there is a cessation, or an alteration, in the character of the urethral discharge; in both there is a feeling of weight and uneasiness about the perinæum; in both there is some difficulty in micturition, perhaps amounting to retention; in both there is some tumefaction to be felt, and much distress is occasioned on introducing the finger into the rectum. . . . It must, on the other hand, be remembered that in inflammation and suppuration around the membranous urethra, though this part lies between the layers of the perineal fascia, there is more or less perineal tumefaction, and that matter so formed may make its way forward, and be discharged by means of the perineal opening. In the cases of acute prostatitis I have seen, neither of these two indications has been present, while in urethritis I have usually observed them. Considering the relations of the prostate and the denseness of the fascia immediately in front of it, I do not see how perineal tumefaction is to be expected as a consequence of prostatitis, any more than swelling in this locality is to be associated with the hypertrophy of the gland as it is seen in old age. I should not have thought it necessary, even to this extent, to have referred to this particular source of error without knowing, of my own verified experience, of the necessity for it, and without feeling that even in some of our best literature there is ambiguity upon this point." The writer then refers to some remarks of Sir Benjamin Brodie on inflammation of the prostate where this confusion appears, and suggests that these remarks, having been copied by late writers, may have been largely responsible for the obscurity referred to. "The other disordered condition," he continues, "which may simulate prostatitis is rare, and it is also curious. I have seen only two cases of it. The primary lesion was rapid œdema of the prepuce, dependent upon plugging of the dorsal vein of the penis. This was quite obvious. In the course of a few days each complained of perineal weight, frequent, rather painful micturition, with great uneasiness referred to the neck of the bladder, which led to its being suggested that in each case the prostate was inflamed. In each I was able to determine by rectal examination that the vesical pain and irritability were not due to any inflammation of the gland, but to the extension of the vein-blocking to the prostatic plexus."

4. MM. Lermoyez and Hitier, one "interne" and the other "externe" of the Paris hospitals, write of the good effects of *pyrogallic acid in soft chancre.* It was employed in the form of a vaseline ointment, of the strength of 1 : 5. Starch is added to the mixture to stiffen it, and prevent its liquefying after it is applied to the body. The formula is as follows: ℞ Starch, 40 parts; vaseline, 120 parts; pyrogallic acid, 40 parts. Care should be taken to have the ointment fresh. On exposure to the air, it soon became brown and lost its strength. It was found equally applicable to all forms of chancroid, and in all situations. It was only slightly painful, though it had a mild caustic effect when first applied. This caustic action soon disappeared. The pain produced, it is claimed, was not greater than would be caused by the contact of any indifferent body with so sensitive a sore. Under its influence the chancres, even when phagedenic, healed with surprising rapidity.

5. M. Le Pileur gives statistics of nineteen *suppurating buboes treated by aspiration* without incision. They are divided into two categories according as the periadenoid tissue was inflamed, as in simple sympathetic bubo, or the gland itself, as in virulent or strumous buboes. Two of the nineteen were submaxillary. Of the seventeen inguinal buboes, nine were cases of simple periadenitis. In these the mean duration of treatment, dating from the first operation, was 11·5 days. Previous statistics of treatment by other methods had given a mean duration of 17 days. Of the cases in the second category, six were chancrous, virulent buboes, and two were strumous. The treatment in these eight cases required a mean duration of 37·5 days. Between the mean of the six chancrous and that of the two strumous there was only a small difference, viz., 36·5 days for the former and 40 days for the latter. In chancrous buboes the advantages of aspiration are stated as follows: 1. The possibility of ascertaining the nature of the pus by inoculation, and at the same time of evacuating the abscess by an insignificant puncture. 2. The pus having been ascertained to be virulent, its destructive effects may be combated by injections of nitrate of silver (1 : 30). 3. The opening, even when ulceration takes place, is not liable to eversion and undermining of its edges, nor to the production of large open chancres. 4. However protracted the healing, it compares favorably with the results obtained by the knife. Statistics published by the author in 1874 give an average of 82 days for eight buboes opened by the bistoury. 5. The cicatrix is insignificant even when ulceration occurs. In the strumous buboes it is admitted that the only material advantage gained is in the avoidance of disfiguring cicatrices. Before operating, the writer waits for distinct fluctuation. [While we are disposed to regard the common practice of making long, free incisions into all suppurating buboes as an extravagance, often causing most unsightly and unnecessary scars, it strikes us that the writer is riding his own hobby in the other direction. Aspiration of buboes has not retained the favor among practitioners generally in which it was held by its first advocates. We believe that in many, if not all cases, without making long incisions, small openings, sufficiently large to permit the constant escape of pus under continued

pressure, will yield more satisfactory results than the treatment by aspiration.]

15. M. Diday proposes a plan of *syphilitic inoculation* which, while affording protection against future syphilitic infection, would itself be attended with but very slight if any manifestations of constitutional disease. He refers to the generally recognized fact that often, in "syphilis by conception," the only evidence of the disease having actually been contracted is in the virtual immunity conferred against infection in subsequent exposures. Under these conditions the subject may be supposed to have taken syphilis in a modified or mitigated form—a form bearing somewhat the relation to ordinary syphilis that vaccinia does to variola. It is from subjects of this kind that Diday proposes to take virus for inoculation. He believes that, were a demand for them once created, such subjects would be found sufficiently numerous. "*J'ose même dire tout bas,*" he says, "*que, sous la fièvre de spéculation qui nous dévore, de telles femmes, dès qu'elles connaîtraient leur valeur vénale, deviendraient aussi nombreuses, pulluleraient ainsi qu'on voit pulluler nos filles trompées, beaucoup moins inexpertes que la pauvre Perrette dans l'art non seulement de vendre leur lait, mais de se fournir de lait à vendre!*" Two methods of performing the inoculation are suggested: First, directly, by means of the blood; and, should this not succeed, secondly, by causing to be produced upon the woman with the mitigated syphilis a "chancroid of Clerc," using the secretion from this for inoculation. [As is well known, the Clercian chancroid is the sore which is produced upon a syphilitic subject by the inoculation of virus from a syphilitic chancre. In appearance this does not differ from the ordinary contagious non-infecting chancre. Whether such a sore is capable, when inoculated upon a healthy subject, of producing syphilis, or only a simple chancroid, has never been positively determined. Two cases are reported by Bidenkap, of women who had never had syphilis, who inoculated themselves with secretion from sores which had been produced by inoculation of matter originally taken from an infecting chancre, though this matter had passed through several generations since. In one case the effect was only local, and the patient subsequently contracted syphilis in the natural way. In the other case the result was somewhat doubtful. A general pustular eruption, and some throat symptoms which followed, have been regarded by some authorities as sufficient evidence of syphilis. Bidenkap and Boeck, under whose care the cases were, did not regard them as such. The first case, however, shows, so far as it goes, that, whatever of syphilitic virus there may be in the chancroid of Clerc, it can not be depended upon to confer immunity from subsequent syphilitic infection; for in this case it is recorded that the patient afterward contracted syphilis in the usual way. But neither, it may be said, does every vaccination take. The subject is altogether speculative, and until it touches some firmer basis of fact than the present affords, Diday's theory must be regarded with suspicion.]

21. Lallemand and Trousseau described certain round, semitransparent, gelatinous-looking bodies, occurring in *the sediment of seminiferous urine*, which were visible to the naked eye, and, according to these authors, enabled the observer to make a diagnosis of spermatorrhœa without the aid of the microscope. Other writers have scarcely alluded to them, and, notwithstanding so much importance was attached to their presence by the authors named, they had been almost entirely forgotten. Professor Fürbringer, of Jena, recalls the subject, and contributes some further information regarding it. He claims that the bodies in question do not occur in seminiferous urine by any means invariably, but, rather, under exceptional conditions. They were only found in urine which had been passed either during or directly after a seminal discharge. They are described as transparent bodies, either spherical, oval, cylindrical, or disk-shaped, having the appearance of boiled sago-grains. They varied in size from that of a millet-seed to that of a lentil, and had the consistence of soft jelly. Under the microscope they appeared structureless, and were studded with numerous spermatozoa. Chemical tests proved them to be albuminous, and indicated that they belonged to the group of globulin substances described by Hoppe-Seyler. They corresponded in all respects with the so-called "sago-grains" which Fürbringer has described as occurring in the seminal vesicles and ampullæ of the cadaver with the "spermatin" of Vauquelin, also characterized by Henle as "fibrin," and by Lehmann as "alkalin albuminal." The rarity of the appearance of these bodies in seminiferous urine is believed to be due to the fact that they are soon dissolved in that portion of the seminal fluid which comes from the testicles, and also in the urine. It is a well-known fact that the jelly-like consistence of the semen directly after emission becomes altered after a little time, the fluid becoming thinner. This change, the writer maintains, is due not to contact with the air, but to the influence of other components of the seminal fluid (such, namely, as are furnished by the testicles) upon the gelatinous secretion of the seminal vesicles. This solution may take place in the seminal vesicles themselves, if they contain semen, or in the urinary canal, if the bodies remain there a sufficiently long time before they are washed away by the stream of urine.

24. Dr. Garnett reports four cases of *cystitis treated with a decoction of broom-corn seed*, made by boiling two ounces of the seed in a quart of water down to a pint, with great benefit, he thinks. [It is not clear that the good results obtained were not largely due to certain adjuvants, which in all of the cases played a more or less prominent part. Such measures as rest in bed, irrigations of the bladder, belladonna-and-opium suppositories, and the like, were employed in every one of the cases reported, and to them, we believe, must be attributed a good share of the success of the treatment.]

27. Dr. Belfield describes the occurrence of *peculiar crystalline formations in the mucous follicles of the urethra and bladder* in three cadavers observed in autopsy-rooms in Vienna. The writer remarks that, although concretions of a concentric, lamellar formation, and analogous to those found in the prostate, have been described by Virchow, Robin, and others, as occurring in these structures, the occurrence of crystals, he thinks, has not been mentioned by any writer before. The crystals were in the form of flat rhomboid prisms with blunt corners, 70 millimetres in length and 30 millimetres in width. They joined together to form rosette-shaped masses. The orifice of the gland could not be seen. The latter was enlarged, and formed a distinct prominence above the surface of the mucous membrane. The chemical nature of these crystals could not be positively determined, nor was it clear how to account for their presence in the mucous follicles. Two possibilities are suggested: that they might have been deposited from the urine flowing over the follicle, or have resulted from a metamorphosis of the mucous and colloid contents of the gland. The former supposition would seem to be the more probable.

37. Mr. Barker reported two cases of *excision of the kidney* at a recent meeting of the Royal Medical and Chirurgical Society. Occasion was taken to review briefly the whole question of nephrectomy. In 43 cases collected, 24 patients recovered, and 19 died. Including cases in which the operation was performed undesignedly or on a wrong diagnosis, there were in all 28 deaths. The causes of these were: peritonitis, 8; shock and collapse, 5; pyæmia, 2; uræmia, 2; wound of pleura and collapse of lung, 1; pulmonary tuberculosis, 1; hæmorrhage during the operation, 1; hæmorrhage after the operation, 2; exhaustion from vomiting, 1; œdema of lungs, 1; exhaustion from suppuration, 1; unrecorded, 3. Of the two modes of operation—in the lumbar region and in the linea alba—the first showed the largest proportion of recoveries. This, however, might be accounted for by the varying nature of the conditions under which the operation was undertaken in the two situations. The points especially brought out by the two cases related were: 1. The necessity of removing the kidney, and it alone, in certain cases, and of not attempting to take away the investing structures with it. 2. The desirability of early operation, before the parts around the organ, and especially the pedicle, had become converted into a mass of dense inflammatory tissue.

39. Three cases of *hydrocele operated upon by the German "Schnitt" method* are described as having occurred under the care of Mr. Lister, two needles having been passed through the skin and tunica vaginalis, for the purpose of keeping the sac in position. An incision was made between them of from one and a half to three inches in length, exposing the testicle. The sac was then washed out with a solution of carbolic acid (1 : 20), the skin was stitched to the tunica vaginalis, and the "Lister" dressing was applied. In one of the cases, instead of the carbolic dressing, a eucalyptus gauze was used, which was found much less irritating to the skin of the scrotum than the former. In all of the cases the operation was successful in curing the hydrocele.

◆

Miscellany.

Army Intelligence.—*Official List of Changes of Stations and Duties of Officers of the Medical Department, United States Army, from July 14, 1881, to August 13, 1881.*—Sternberg, G. M., Major and Surgeon. Relieved from duty in connection with the National Board of Health, to proceed from Baltimore, Maryland, to San Francisco, California, and report to Commanding General, Department of California, for assignment to duty. S. O. 182, A. G. O., August 10, 1881. ═══ Hubbard, Van Buren, Captain and Assistant Surgeon. Granted leave of absence for four months. S. O. 169, A. G. O., July 26, 1881. ═══ Corson, J. K., Captain and Assistant Surgeon. The leave of absence granted him in S. O. 61, May 31, 1881, Department of Arizona, extended two months. S. O. 179, A. G. O., August 6, 1881. ═══ King, W. H., Captain and Assistant Surgeon. Now awaiting orders at Greencastle, Pennsylvania, to report in person to Commanding General, Department of the East, for assignment to temporary duty. S. O. 171, A. G. O., July 28, 1881. ═══ Hall, J. D., Captain and Assistant Surgeon. Granted leave of absence for one month, with permission to apply for three months' extension, to take effect on final adjournment of G. C. Martial, of which he is Judge-Advocate. S. O. 141, Department of Dakota, August 4, 1881. ═══ Ainsworth, F. C., Captain and Assistant Surgeon. Relieved from duty at Fort Clark and assigned to duty as Post Surgeon at Fort McIntosh, Texas, relieving Assistant Surgeon Gorgas. S. O. 90, Department of Arizona, July 14, 1881. ═══ Semig, B. G., Captain and Assistant Surgeon. Granted leave of absence for six months, with permission to leave the Department of the Platte. S. O. 182, C. S., A. G. O. ═══ Mays, L. M., Captain and Assistant Surgeon. Now awaiting orders in Washington, D. C., to report in person to commanding officer, David's Island, New York Harbor, for temporary duty at that post. S. O. 158, A. G. O., July 13, 1881. ═══ Comegys, E. T., Captain and Assistant Surgeon. Now awaiting orders at Cincinnati, Ohio, to report in person to commanding officer, Columbus Barracks, Ohio, for temporary duty at that post. S. O. 158, C. S., A. G. O. ═══ Torney, G. H., Captain and Assistant Surgeon. The leave of absence granted him from Headquarters, Department of the Missouri, June 21, 1881, extended one month. S. O. 76, Military Division of the Missouri, July 25, 1881. ═══ Gardiner, J. de B. W., Captain and Assistant Surgeon. The extension of leave of absence granted him March 14, 1881, from A. G. O., further extended six months. S. O. 157, A. G. O., July 12, 1881. ═══ Perley, H. O., Captain and Assistant Surgeon. Granted leave of absence for four months. S. O. 178, A. G. O., August 5, 1881. ═══ Gardner, E. F., First Lieutenant and Assistant Surgeon. Relieved from duty in Department of Dakota, to proceed to Eastport, Maine, and on arrival there report by letter to the Surgeon General. S. O. 171, C. S., A. G. O. ═══ Gardner, E. F., First Lieutenant and Assistant Surgeon. The operation of par. 3, S. O. 171, C. S., A. G. O., in his case suspended one month. S. O. 177, A. G. O., August 4, 1881. ═══ Gorgas, W. C., First Lieutenant and Assistant Surgeon. When relieved at Fort McIntosh, Texas, to report to commanding officer, Fort Duncan, Texas, as Post Surgeon. S. O. 90, C. S., Department of Texas. ═══ White, C. B., Major and Surgeon. Died at Wilton, Connecticut, August 10, 1881.

THE
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OCTOBER, 1881.

Original Communications.

ON RECTAL EXPLORATION AND DIAGNOSIS.

By CHARLES B. KELSEY, M. D.,
SURGEON TO ST. PAUL'S INFIRMARY FOR DISEASES OF THE RECTUM.

To one who has been trained in the habit of making a diagnosis before undertaking treatment it seems superfluous to insist upon the necessity of a physical examination in every case of rectal disease; and yet my own experience from day to day only convinces me the more firmly of the necessity of thus insisting.

The majority of patients who seek advice for this class of troubles come to the surgeon with the diagnosis of piles or fistula ready at hand—and, I am sorry to say, many of them come with the authority of some physician for that diagnosis—in whom, nevertheless, the merest inspection is sufficient to prove the existence of much more serious, and often of incurable, disease. This is not due to ignorance, but to carelessness, to too great faith in the statements of the sufferers, and often to a false modesty on the part of the practitioner which leads him to accept such statements in lieu of a thorough examination.

The symptomatology alone is of little value in the diagnosis of rectal disease; it is almost never sufficient in itself for a diagnosis. There is a train of symptoms common to almost all diseases of this part and which infallibly points to trouble of some kind, but they do not tell what that trouble is. The pain of a fissure is, perhaps, diagnostic of the fissure, but it does not tell what troubles may be associated with the fissure; and so it is in every other affection. For this reason the practitioner who attempts to treat a case of disease of the rectum without first making a direct examination uselessly risks his reputation as a diagnostician, and in my own practice I am guided by the simple rule that patients, male or female, who have not yet come to the point which makes them willing to submit to an examination, have not yet reached a point which admits of treatment. An examination, especially in women, is sometimes, though not often, difficult to obtain, and the dread of it keeps many sufferers from seeking relief; but still the rule I have laid down is the only safe one, and the surgeon who allows himself to be persuaded into "recommending something for piles" will sooner or later have a mistake in diagnosis laid to his charge, nor will the fact that he was moved by consideration for the patient's sensibilities save him from blame.

As I say, to one who has been trained in the practice of diagnosis these remarks will seem superfluous, but there is, perhaps, no better proof of their necessity than the fact that twice within one week I have been compelled to make a diagnosis of malignant disease in cases that had been sent to me by brother practitioners for operation for supposed hæmorrhoids.

How, then, to proceed to make a rectal examination which shall be at the same time thorough and as free from pain as possible? Two things are necessary above all others—a good bed or table and a good light. For a table, a strong four-legged one, upholstered with hair and leather, answers every purpose. It should be hard, without springs, and about thirty inches in

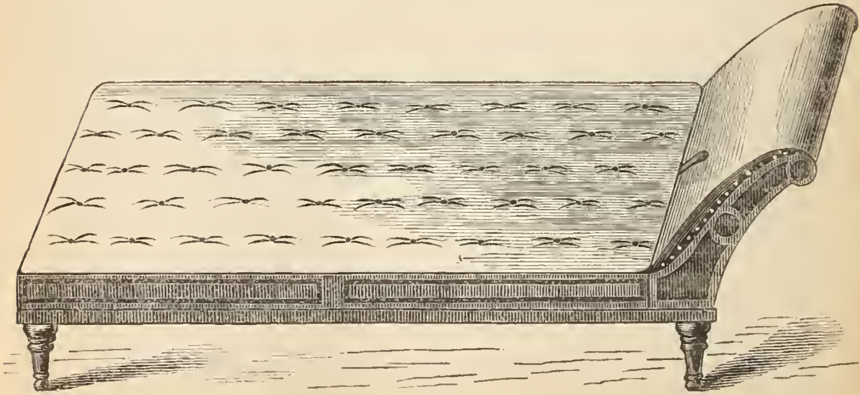

FIG. 1.

height. In place of this, any of the examining tables of the gynæcologists may be used. In my own office I use the couch represented, closed and open, in Fig. 1 and Fig. 2. Its great advantage is that when not in use it answers as an ordinary piece of furniture, and when raised it provides a firm, hard operating table of convenient height. Either natural or artificial light may be used, but the latter is on some accounts preferable, being always at command and easily thrown up the bowel or concentrated upon a particular point. To do this, a forehead mirror is requisite. The lamp which I have found most convenient is a modification of Tobold's, as represented in Fig. 3. The whole apparatus is easily moved to any part of the room, and is not cumbersome, and with the lens a very powerful illumination is always attainable.

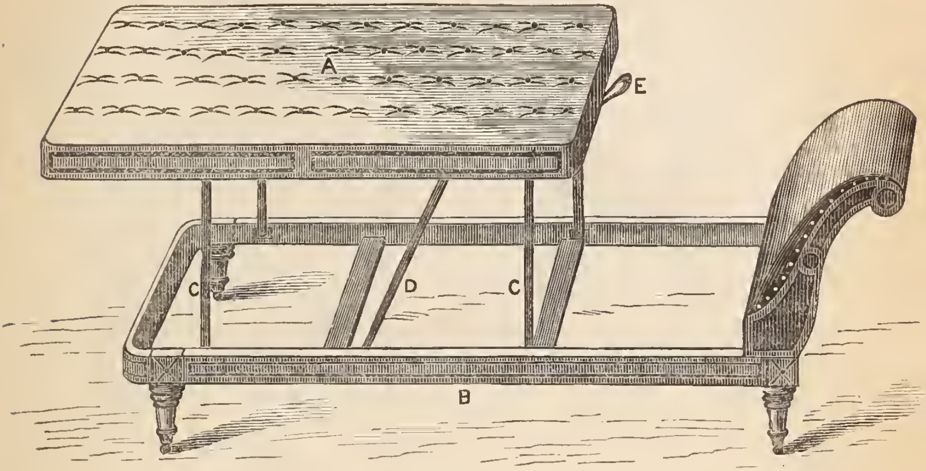

FIG. 2.

The instruments necessary are specula of various forms, bougies, a Davidson's syringe, ointment, cotton, sponge-holders, towels, basins, etc.; and these should all be placed within easy reach of the hand. A convenient case for these things, which is intended to stand on the floor by the side of the table or bed, is represented in Fig. 4.

The position in which the patient should be placed is a matter of some importance. For mere inspection of the anus and surrounding parts the dorsal decubitus answers every purpose, and a digital examination of the rectum may be made either in this posture or with the patient on the side. For a speculum examination or the passage of a bougie the patient should be placed on the side, with the buttocks well elevated, the thigh which is uppermost strongly flexed on the abdomen, and the breast resting on the table. In this way the weight of the abdominal contents falls upon the front wall of the abdomen and not upon the pelvis, and the lumen of the bowel is not so firmly closed, nor is the mucous membrane so firmly forced into the end of the speculum.

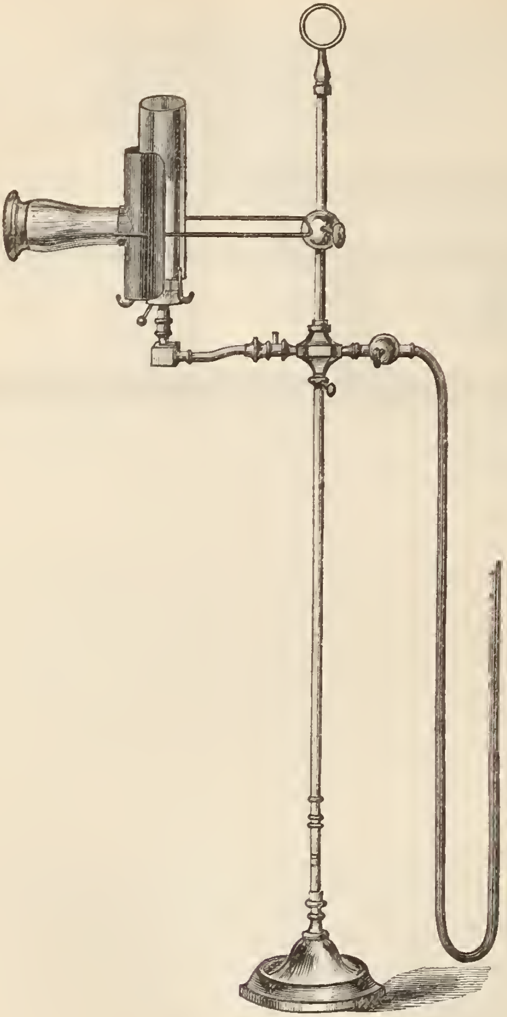

FIG. 3.

Before commencing an examination the bowel should be emptied, either by the natural effort of the patient or by an enema, and for this reason a water-closet in connection with the examining room is almost indispensable to the practitioner in rectal disease.

In this way the patient may come directly from the closet to the table with the parts in the best condition for inspection.

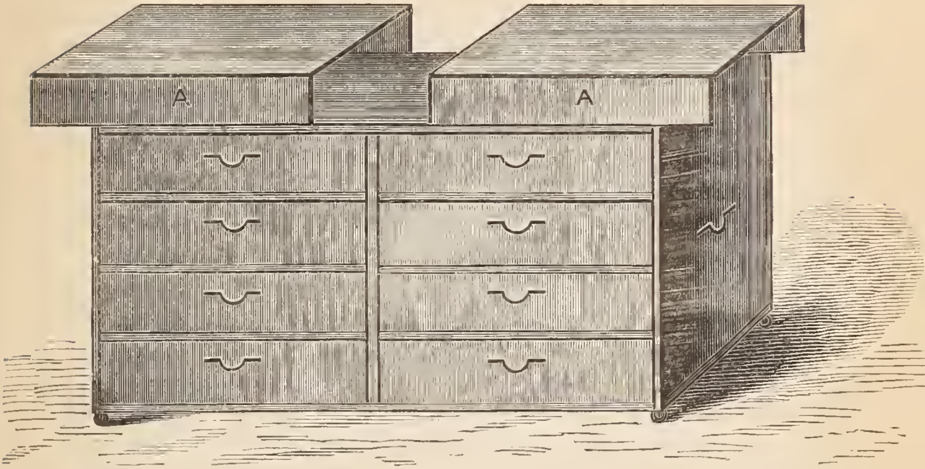

FIG. 4.

A simple inspection of the anus and adjacent skin and mucous membrane is often sufficient for a diagnosis, though it should never be trusted to alone. External hæmorrhoids and internal ones when brought down by the use of the closet or enema; external fistulæ; ulceration; skin diseases; many venereal affections; pin worms; abscess; and fissure—may all be recognized in this way. A glance at the anus, too, may indicate to the practiced eye the existence of serious disease within the rectum proper, for a discharge may flow from it which marks ulceration above, and it may be relaxed and patulous from over-distention or partial destruction of the sphincter. A sunken condition of the ischio-rectal fossæ, and a retracted anus surrounded by a profusion of soft fine hair, may also properly excite a suspicion either of grave rectal disease or of some constitutional affection which is causing emaciation.

By using gentle force in pulling the anus open with the fingers, the mucous membrane may be everted to a considerable degree, especially if the patient can be brought to assist by an effort at bearing down. In this way a fissure may almost always be brought into view without the use of a speculum of any sort, and the internal opening of the great majority of fistulæ may be reached, with a good view of the radiated folds and lacunæ.

Dr. Storer,* of Boston, has described a method of examining the mucous membrane just within the anus, which is applicable only in women who have a lax sphincter. It consists in everting the mucous membrane by pressing it out of the anus by the index finger in the vagina. In a case in which the manœuvre can be practiced successfully and without too much pain, a small portion of the anterior wall of the rectum may be brought into view. The pessary of Gariel has also been used for the same purpose. It consists of a rubber ball which is introduced empty into the rectal pouch, then inflated by means of a tube attached to it, and withdrawn with some force, the mucous membrane being prolapsed in front of it. But neither of these two procedures is of any great value.

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* "Lancet," May 31, 1873.

After having examined the anus in this way, the surgeon next proceeds to the more difficult task of examining the rectum, an operation which may be done skillfully and almost painlessly, or awkwardly and with great suffering. The rectum may be explored either by the touch alone, or by vision alone, or by both combined. The former is the simpler and more painless method, and with practice may be made to afford all the information which can be gained by the two combined.

To practice the rectal touch, the nail of the index finger should be well trimmed and the finger lubricated with some tenacious oil. Olive oil is much better than vaseline, the latter being too easily rubbed off by the sphincter. The condition of the sphincter muscle is first to be noted. Its resistance should be overcome by a slow and steady pressure with the ball of the finger, and not by a sudden exertion of force, for such an attack is always met by increased contraction. The force of the muscle will be found to vary greatly in different people. In the aged or debilitated it is lax; in the strong and healthy it is the opposite, and the finger can scarcely be passed through it without great pain and sometimes a slight laceration of the tender mucous membrane. When inclined to spasmodic contraction, as it sometimes is in persons of nervous tendency, a satisfactory examination may be impossible without the use of ether, on account of the pain.

Unless an obstruction is encountered, the finger may be carried up the bowel its full length and pressed as far as possible beyond this point. Additional distance may be gained by passing the three remaining fingers backward along the inter-gluteal groove, instead of closing them in the palm, as is generally done, and pressing the knuckles against the soft parts; for the knuckles prevent the full passage of the index finger.

In this way three or three and a half inches of the rectum may be carefully explored, together with the prostate, the neck of the bladder, the uterus, and the anterior surface of the coccyx and lower part of the sacrum. With an exceptionally long finger it may even be possible to feel the vesiculæ seminales and vasa deferentia. In other words, all that part of the bowel which is most subject to disease is brought within reach. But after this is done the examiner may be no wiser than before, for to appreciate fully the condition of the rectum by the sense of touch alone requires a facility in this method of exploration which most practitioners never attain. In the majority of cases a digital examination will be made to discover whether or not the patient is suffering from internal hæmorrhoids, and in the majority of cases also the examiner will be no wiser on this point after than before, for a soft internal hæmorrhoid is a difficult thing to detect by the finger alone, being readily mistaken for the natural mucous membrane of the part, especially when the latter is abundant and gathered into folds, as it is apt to be.

Ulceration is another condition which it is sometimes difficult to detect, especially when superficial and not attended by much induration; and so is the opening of a blind internal fistula; and yet, so well educated may the finger become that other methods of examination may be almost completely discarded. To carry diagnosis to this point it is first necessary, by oft-repeated examinations, to become perfectly familiar with the feel of the normal bowel. After this knowledge has been gained, a gentle sweeping of the ball of the finger over the whole inner surface of the lower three inches of the rectum will detect any change in it, however slight. I wish it were possible to describe plainly the different sensations which are conveyed by the different pathological conditions, but this is a thing each practitioner must learn for himself by practice.

A stricture of small caliber can not easily be mistaken, though one which admits the finger without constricting it may easily be overlooked. A stricture small enough to engage the end of the index finger firmly marks the limit of safe digital examination, and the finger should not be forced through it for the sake of feeling what is above, for an attempt to do this has been followed by a fatal rupture of the bowel. In case of a tumor of any kind, advantage may be taken of conjoined manipulation through the vagina in the female; but these are the troubles most rarely met with, and most easily diagnosticated when encountered. The cervix or fundus of the uterus, when pressing upon the bowel, may be distinctly felt with the finger in the rectum, and may deceive the unwary into a diagnosis of a new growth. The different varieties of ulceration have each its peculiar and often diagnostic feel.

For examination by the sense of touch above the reach of the finger, recourse must be had to bougies. These are of all forms, sizes, and materials, and, in general words, the softer the instrument the better it is for examination. I much prefer the black rubber instrument, with the blunt point (Fig. 5), which may readily be bent into a circle in the hand, to all others in the market, and the same instrument comes with a sharp point (Fig. 6), which sometimes answers a good purpose. These instruments are made in twelve different sizes, and for the purpose of diagnosis the medium-sized is the best. The old-fashioned red, hard-rubber bougie is unnecessarily stiff and dangerous, and should be discarded, having no advantages over the softer ones, either for the purpose of diagnosis or for that of treatment. The *bougie à boule*, made of hard rubber with a flexible whalebone handle, is a favorite instrument with many. (Fig. 7.)

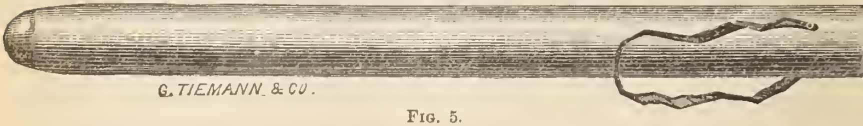

Fig. 5.

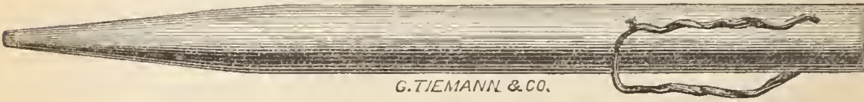

Fig. 6.

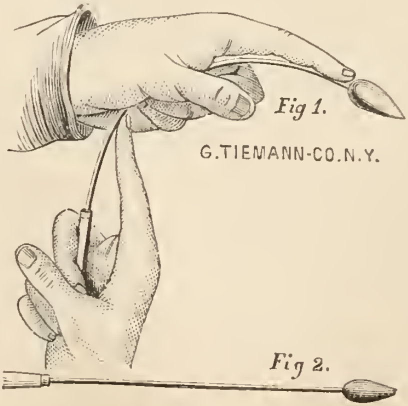
Fig 1.
G.TIEMANN-CO.N.Y.
Fig 2.

Fig. 7.

For my own use I have had a kind of bougie made by Messrs. Stohlmann, Pfarre & Co., which I prefer to all others, for the simple reason that it is softer and more flexible than any in the market.

It is made of the same material as the red soft-rubber catheters, and differs from them only in size and in the thickness of its walls. With such an instrument one is pretty certain not to perforate the bowel, and for diagnosis it answers every purpose as well as the harder instruments. The better fitted a bougie is for pushing its way through a stricture, the worse it is for rectal exploration.

These instruments are all used for the same purpose—that of feeling for a stricture located above the reach of the finger; and with any of them the unpracticed hand will generally detect an obstruction in the perfectly healthy bowel at about four inches from the anus. To pass a bougie into the rectum is rather a more difficult operation than to pass one into the urethra, the triangular ligament in the latter being replaced by the curves, the folds of mucous membrane, and the promontory of the sacrum in the former. Independent of Houston's valves of mucous membrane, it is not improbable that a slight degree of invagination of the upper into the lower part of the rectum may often exist, and into the sulcus formed by this condition the point of the bougie may easily pass. For the sake of overcoming these folds of membrane, the most minute directions have been given as to how the bougie should be introduced and gently urged along each successive inch of the bowel* by changing its direction and manipulating the handle. But such rules are of little value, for the simple reason that the obstruction is seldom of the same kind or in the same place in two different persons. Esmarch † gives the general rule that the patient should lie on the left side, as the chief and most constant fold of membrane, the plica transversalis recti of Kohlrausch, projects from the right wall. The instrument should be passed gently, for force is never allowable here more than in the similar operation on the urethra; and when an obstruction is met with, the handle should be gently rotated, withdrawn, and again passed onward, till by frequent repetitions of this manœuvre it is made to pass. If this does not suffice, a Davidson's syringe may be attached to the lower end of the bougie, and a stream of warm water or oil thrown through it with considerable force against the obstruction while gentle pressure is maintained.

For measuring the extent of a stricture an ingenious instrument has been devised by Laugier, which consists in attaching a thin rubber glove-finger to the end of a perforated bougie. This is passed up the bowel empty, and then inflated and withdrawn till it reaches the upper limit of the obstruction. It is safer than the *bougie à*

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* Houston, "Dublin Hosp. Reports," vol. v, 1830.

† "Die Krankheiten des Mastdarmes und des Afters," Pitha und Billroth's "Chirurgie."

boule, for it may be allowed to collapse before being withdrawn, and all straining of the diseased tissues may thus be avoided.

In case disease actually exists high up in the bowel, the attempt to pass an instrument is full of danger. A patient may easily recover from a false passage made in the urethra, but such will seldom be the case with the rectum, for here when the instrument leaves the bowel it enters the peritonæum. To understand this danger, it is only necessary to remember that the bowel is generally ulcerated both above and below the seat of the contraction, and is sometimes weakened to such an extent that it will allow a bougie to pass through it without the use of any appreciable force on the part of the surgeon. The bowel may also be lacerated without being directly perforated by the bougie, for the stricture may be pushed upward or dragged downward on the point of the instrument till the bowel gives way.

Supposing, now, that a rectal bougie can not be passed eight or ten inches up the bowel, is it safe on this account alone to make a diagnosis of stricture high up? I should hesitate long before doing so, and should make many careful attempts to pass the instrument at different times, resorting to ether if necessary, carefully exploring through the abdominal wall for induration, and watching for the usual signs of obstruction. There are one or two points worthy of remembrance in this connection. The first is that the obstruction due to a stricture will always be at the same point in the canal; and another is that when a bougie has once become engaged in a stricture it is firmly grasped, and the resistance to its withdrawal is equal to that encountered in introducing it farther. The feeling conveyed to the hand under these circumstances is diagnostic, and is like that which is felt when the effort is made to withdraw a sound from the grasp of a stricture in the urethra.

Should it still be necessary for diagnosis, the speculum may be used and the inside of the rectum illuminated. I have postponed any reference to this means of examination till the present, because it will generally be found useful only after the others have been tried. The thorough use of the speculum involves, almost of necessity, the administration of ether and the stretching of the sphincter muscles; to try to use it without these adjuncts is almost to inflict useless pain upon the patient. I shall not attempt any description of the infinite number of instruments which have been invented for this purpose, or any judgment upon their relative advantages, but will merely say that the best vaginal speculum is still the best for the rectum—that of Sims, with a groove where the blade joins the handle, for the sphincter to rest in (Fig. 8). The fenestrated instrument, Fig. 9, is sometimes useful for inspecting the parts just within the anus; and a long vaginal cylindrical speculum, with the end cut at such an angle as will best expose the mucous membrane, may sometimes be of service in bringing into view a small portion of the inner surface of the bowel high up. But, after all have been tried, none will be found better for any purpose than a small-bladed Sims's, and without ether all will be found eminently unsatisfactory.

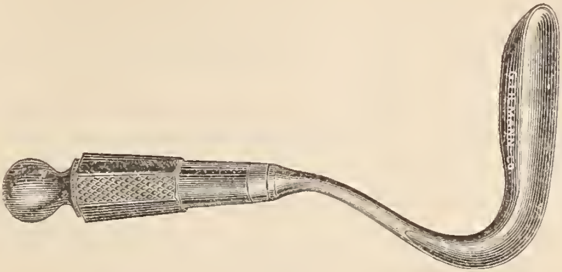

FIG. 8

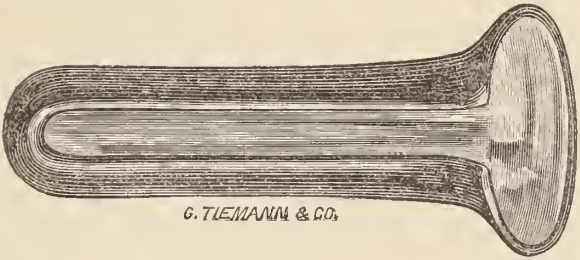

FIG. 9.

With the patient in the proper position on the side, under the influence of ether, with the sphincter thoroughly dilated, and with a good reflected light, the lower four or five inches of the rectum may be thoroughly illuminated and examined. A couple of inches more may be seen by the use of the cylindrical speculum, with the patient standing and bending forward over the table, and assisting the examiner by straining down; and in this way a stricture may sometimes be brought into view which could not be seen with the Sims's speculum alone.

As a rule, however, a speculum will be found of very little use in the examination of stricture, but is chiefly available for obtaining a good view of other morbid processes affecting the rectal pouch, and for making applications to them or performing operations for their cure. By its aid the different varieties of ulceration may be inspected and thus differentiated, the internal openings of fistulæ may be located, and the whole rectal pouch may be brought into view.

From what has been said, it may readily be seen that the diagnosis of stricture above the reach of touch or vision is a difficult matter. So difficult is it in some cases that no less an authority than Syme* has written that there is good reason to suspect the honesty of a man who pretends to detect such a condition. Such is indeed the case, for "strictures high up" are favorites among a certain class of quacks, and the passage of a bougie two or three times a week for an indefinite period is profitable business. In reality, strictures above the rectal pouch are rare; when they exist, they are usually malignant, for this part of the bowel is not subject to the influences which, by exciting ulcerative action, result in the cicatricial contractions which so often affect the lower three inches of the rectum; and malignant disease of the sigmoid flexure or descending colon will manifest itself by a well-marked train of constitutional and local symptoms, and can generally be felt better through the abdominal wall than per rectum.

After the use of the bougie, which is at best an uncertain means of diagnosis for this condition, and after a study of the symptomatology, and a careful examination through the abdominal wall, there is still one other means of exploration open to the surgeon if he have a sufficiently small hand—the passage of the whole hand into the rectum.† A hand which measures seven and a half inches in circumference can generally be passed easily; one measuring more than nine is unfit for the purpose. With a small hand there is no danger of permanent incontinence of fæces, but the sphincter should be dilated gently and gradually, rather than forcibly torn open.

When the anus has been sufficiently dilated to allow the hand to enter the rectum, if the bladder is empty the arch of the pubes may be felt above the prostate; if full, it will be easily distinguished at the same point. The uterus and ovaries are easily made out anteriorly, and the whole curve of the sacrum may be followed posteriorly. The next point to feel for is the spine of the ischium on either side, and with this as a guide the greater and lesser sciatic notches may be outlined. The whole brim of the pelvis may be traced, and the external and internal iliac arteries followed with the fingers. All this may be done while the hand is in the rectal pouch, and it may be done upon almost any patient, male or female, though more easily upon the female, with a small hand, without causing any unpleasant after-results. But in many persons this is all that can be gained by this method, for the anatomical reason that to pass the hand above into the sigmoid flexure is often attended with great danger from the narrowing of the bowel at this point. When the hand is met by a sense of constriction at about the level of the third sacral vertebra, where the lateral fold of Douglas is reflected from the bowel, the limit of examination has been reached, and no force should be used to overcome the constriction, which can only be accomplished by a rupture of the peritoneal coat. In many cases, however, by carefully following the natural windings of the canal, and by a semi-rotatory movement of the hand, combined with alternate flexing and extending of the fingers, this point of danger may be surmounted and the hand be passed fairly into the sigmoid flexure, and sometimes into the descending colon. Here the common iliacs, the bifurcation of the aorta, the left kidney, and, in fact, nearly all of the abdominal contents may be touched.

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* "Diseases of the Rectum," Edinburgh, 1838.

† G. Simon, "Ueber die künstliche Erweiterung des Anus und Rectum," "Arch. f. klin. Chir.," xv, 1, 1872; "Dtsch. Klin. f. Chir.," Nov., 1872; W. J. Walsham, "Some Remarks on the Introduction of the Whole Hand into the Rectum," "St. Bartholomew's Hosp. Rep.," vol. xii, 1876, p. 223.

By this method of examination a stricture situated in the sigmoid flexure, or even in the descending colon, may sometimes be discovered after all other methods of examination have failed; but, as we have shown, the method is not always applicable, and the diagnosis of stricture high up still remains one of the most difficult things in surgery. In the great majority of cases in general practice in which such a diagnosis has been made, it may be proved false by the introduction of a full-sized bougie after a few trials, and in the remainder the diagnosis will be confirmed sooner or later by the well-marked symptoms of intestinal obstruction.

THE CORPUSCULAR ELEMENTS OF THE BLOOD; THEIR ANATOMY AND PHYSIOLOGY, NORMAL AND PATHOLOGICAL.

By ALEXANDER DUANE, M. D.

(Continued from September Number.)

THE BLOOD-CORPUSCLES IN DISEASE.

When the old humoral pathology was in vogue, and almost every disease was attributed to the presence of noxious substances in the blood, the constitution of the latter fluid under morbid conditions was naturally a subject of careful study. We have to-day many analyses which have come down to us from this time, and which, it was hoped, would throw light upon the nature and causes of disease. Unfortunately, the results of different observers were so discrepant that scientific men began to doubt altogether the utility of such investigations; and the theory of a connection between the blood state and various pathological conditions fell somewhat into disrepute. Partly on this account and partly because of the rise of a new system of pathology—partly also because the decline of venesection as a routine practice has rendered the analysis of large masses of blood almost impossible—the study of the blood in its pathological relations has been much neglected. But the invention of the various instruments for measuring and numerating the corpuscles and the discovery of certain "essential" blood lesions have lent a new impulse to investigation in this field; and as a result it seems likely that in the future we shall stand on much firmer ground than we have done heretofore. Yet we must allow that at present our knowledge is in rather an inchoate state. Only a few facts have been undeniably established, and, as to other matters, assertions which have been made in the most positive way by some have been as positively denied by others. Accordingly, in sketching the pathology of the blood cells we must do so with the confession that in many points the sketch will be unavoidably defective.

Before speaking of the blood diseases proper it will be well to consider, in a general way, the alterations which the blood corpuscles may experience in disease; the causes of these alterations, so far as known ; the symptoms to which they give rise; the methods of their diagnosis; and the therapeutic means by which their effects are remedied. We shall take this opportunity to define terms which have lately come into use, and which aim to express the character of the lesions more scientifically and separate one diseased state from another more sharply; for it is true that to-day scientific men are endeavoring by a more philosophical classification to place the pathology of the blood on a new basis. It is the growing opinion that the blood is to be regarded as a tissue, and that, like other tissues, it may atrophy, hypertrophy, or degenerate.* Studied in this light, the diseases of this fluid are no longer to be classed according to the symptoms which they produce, but rather according to the lesions upon which they are founded. It is this view that we wish to enforce in the general consideration which follows.

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* As an instance of this tendency, Kottmann (quoted by Mosler in von Ziemssen's "Cyclopædia") speaks of leucocythæmia as a neoplasm of the blood, associated with numerical hypertrophy of some of its elements and atrophy of others, and disseminating itself in distant organs.

General Pathology.—The corpuscles may present abnormal variations in number, size, shape, or constitution.

The *number* may be either increased or diminished; the range being from double the usual amount to one fifth, one tenth, or even a smaller fraction of that quantity. Since, however, the corpuscles are usually numerated in proportion to a certain amount of plasma, it is evident that relative changes detected by such numeration may admit of three different interpretations. Thus, either the total number of corpuscles has altered, while the plasma remains unchanged; or the latter has changed, while the former remains the same; or both have altered, but to a different degree or in an opposite sense. On the other hand, and this probably happens very often, the number of corpuscles may experience an absolute variation which can not be appreciated by the ordinary methods, because the plasma varies in the same ratio. We are thus led to draw a distinction between an absolute and a relative change in the corpuscular mass. For these changes we have names, which are so constantly employed as to require mention. An increase in the number of red corpuscles, whether absolute or relative, is termed hypercytosis, or, as we should prefer to say, erythrocytosis; an increase in white corpuscles is called leucocytosis, if the excess is not very marked and is transient, and leucocythæmia, if permanent and extensive. An absolute decrease in red corpuscles (absolute anæmia) is called hypocytosis,* or, better, oligocythæmia; a relative anæmia, caused by an excess of plasma, being hydræmia, or the "hydræmic plethora" of a former terminology. It must not be thought that these are mere fanciful distinctions, or such as do not represent actually existing states. Each condition specified not only occurs in practice, but has its own pathological significance, and perhaps its peculiar therapeutic indication. It might be thought that, as long as the number of corpuscles remained the same, the addition or subtraction of more or less plasma would make no difference in their function. But this is not found to be so. A relative anæmia, due to excess of plasma, presents all the symptoms indicating imperfect performance of corpuscular function, and this because the requisite number of cells is not brought into relation with the tissues along with that amount of fluid which the parts customarily receive. The corpuscular function is, so to speak, too much spread out. Moreover, this dilution may go so far as actually to destroy the corpuscles by solution in the excess of water. Again, a relative plethora, due to abstraction of the serum, such as occurs after diarrhœa and sweating, and especially in cholera, does not heighten the respiratory power of the erythrocytes, because more of them are brought to the lungs in each cubic millimetre of blood; on the contrary, their function is diminished, and they themselves share in the general deprivation of water. It seems necessary, therefore, that, for the blood cells to maintain their function or even preserve their integrity, a certain relation must exist between their mass and that of the plasma. But it must not be imagined that, because this is so, the corpuscles can be increased or diminished with impunity, provided the plasma suffers the same change. For it seems also necessary that the total number of corpuscles should not vary much from the normal amount. Moreover, variations in the total quantity of plasma must be taken into account, as these undoubtedly exert an effect upon the corpuscular function and modify the symptoms dependent upon disturbance of the latter. The rapidity of the circulation, the degree of intra-vascular pressure, and the extent of transudation are some of the phenomena influenced by these variations.

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* Perhaps it would be better to expand the use of "hypercytosis" and "hypocytosis" to any increase or deficiency in the red cells, as perceived by the hæmocytometer; while "erythrocytosis" and "oligocythæmia" would be restricted to an absolute change in the number of corpuscles.

The *size* of the corpuscles may show pathological variations. In accordance with the nomenclature which has already been adopted, we may designate a slight excess of abnormally large red corpuscles by the term megalocytosis, and an excess of small or embryonic corpuscles by the term microcytosis. Both these conditions are observed in anæmic blood. It is easy to understand why the arrested development of numerous small corpuscles should produce the symptoms of anæmia; but why, under the same conditions, abnormally large corpuscles should be found is not so apparent. If, however, the large cells represent an amount of original material which might have formed two or three erythrocytes of the normal size, the waste is obvious; for, as already pointed out, the same mass of corpuscular matter, when divided into parts, presents a surface for gaseous diffusion which increases in proportion to the number of these parts. Besides, these large cells are proportionately poor in hæmoglobin, and in general show signs of deficient evolution and of incapacity for the performance of their function. In rare cases a great excess of small corpuscles is found in the blood. This condition, which is called microcythæmia, is probably indicative of extensive destruction of the erythrocytes. The same explanation serves for a much more common occurrence, namely, the appearance of free pigment matter in the vessels and organs. This is called melanæmia, and is most marked in connection with malarial affections. It is to be regarded as a final stage in the process of which microcythæmia forms the initial lesion.

The *shape* of the corpuscles may undergo considerable alterations in disease. In various forms of anæmia the red cells have been observed to become spherical or pyriform, or to have assumed the shape of a hammer, an anvil, a biscuit, etc. Further, the central depression may be displaced to one side, or the coloring matter may be confined to one portion of the cell. The occurrence of such anomalous forms is signalized as poikilocytosis. It indicates apparently either a lessened power of resistance on the part of the corpuscles, or greater exposure to disturbing influences, or possibly a failure to remove effete forms.

Nucleation of the red corpuscles has been frequently reported. To these nucleated corpuscles Ehrlich * gives the names normoblasts, megaloblasts, and microblasts, the prefix indicating the size of the cell. The normoblasts, which occur especially in ordinary symptomatic anæmia, possess a nucleus which can be extruded entire, and is capable of further development when separated from the cell. The megaloblasts, appearing prominently in pernicious anæmia, lose their nucleus by a degenerative change. The microblasts, Ehrlich says, are exceedingly rare. The occurrence of nucleation is probably an evidence of imperfect development in the red corpuscles, and indicates, therefore, some failure in the cytogenetic organs.

In *composition* the most important change which the corpuscles experience is in their hæmoglobin. In amount this may be either increased or diminished; and such alteration may be absolute, affecting the entire mass contained in the blood; relative, affecting the proportion which this substance bears to the plasma; or corpuscular, affecting the individual richness of each corpuscle. Excess in this constituent is called hyperchrosis or polychromæmia; deficiency, hypochrosis or oligochromæmia. Since this double nomenclature already exists, it is better to utilize it by appropriating one set of terms (hyperchrosis, hypochrosis) to changes in the corpuscular richness, and applying the others to denote changes in the general amount of hæmoglobin. Either form of variation, it is evident, must be accompanied by corresponding alterations in the function of the erythrocytes. Indeed, it might seem at first sight that the degree of anæmia or plethora would be entirely dependent on an increase or decrease in the hæmoglobin. But, when we consider that the respiratory capacity of a corpuscle is determined not only by its mass but also by the surface which it presents, we see that variations of size and shape must have something to do with these alterations of functional efficiency. The hæmoglobin has been thought to vary not only in quantity but also in quality, so as to be capable of taking up less oxygen at one time than at another. This idea seems plausible enough, since we know that the oxygen-bearing power of the corpuscles may be diminished by the action of certain substances, the so-called respiratory poisons. At present, however, we have no means of appreciating these differences in quality, and no specific name has been assigned to the condition in which the capacity of the hæmoglobin for oxygen is markedly diminished.

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* "Berl. klin. Woch.," July 12, 1880.

The power of *amœboid movement* may occur as a pathological phenomenon in the red corpuscles. The occurrence is probably to be classed along with the curious deformation of shape, previously mentioned—both indicating a low degree of stability and lessened vitality associated with a high amount of protoplasmic activity. In the white corpuscles the power of amœboid movement may be either increased or diminished. The former appears to be the case in inflammation; the latter, in some cases of leucocythæmia.

For convenience we will recapitulate the changes just enumerated, in a tabular form.

CHANGES OF CORPUSCULAR ELEMENTS IN

Number.	Increase of red cells	absolute—erythrocytosis.
		relative—hypercytosis.
	Increase of white cells	moderate—leucocytosis.
		excessive—leucocythæmia.
	Decrease of red cells	absolute—oligocythæmia.
		relative—hypocytosis.
	Decrease of white cells.	
Size.	Increase in size of red cells—megalocytosis.	
	Decrease in size of red cells	in moderation—microcytosis.
		in excess—microcythæmia.
		carried as far as destruction of red—melanæmia.
Shape.	Alterations in shape of red cells—poikilocytosis.	
Nucleation.	Nucleation of red cells, which are called	microblasts,
		normoblasts,
		megaloblasts.
Hæmoglobin.	Increase of hæmoglobin	absolute—polychromæmia.
		corpuscular—hyperchrosis.
	Decrease of hæmoglobin	absolute—oligochromæmia.
		corpuscular—hypochrosis.
	Alteration of quality.	
Amœboid movement.	Present in red cells.	
	Increased in white cells.	
	Decreased in white cells.	

General Etiology.—The causes which may produce alterations in the blood corpuscles may be grouped as follows:

1. Those which promote cell-formation.
2. Those which retard cell-formation.
3. Those which promote cell-destruction.
4. Those which retard cell-destruction.
5. Those which alter the physical or chemical properties of the cells.
6. Those which disturb the quantitative relations between the plasma and the cells.

1. Causes promoting cell-formation may be, in the first place, (*a*) anything which supplies an excess of blood-forming material to the cytogenetic organs. Thus, the ingestion and assimilation of a large quantity of nutritious food, and the exaltation of the nutritive processes generally, will have this effect. From what we know of the influence of food upon corpuscular abundance, it seems likely that the primary result in these instances is an increase of the white corpuscles, an increase of the red cells being a more remote consequence. In any case a pathological excess of corpuscles from this cause must be rare, because increased nutrition is almost always accompanied by an increased metamorphosis of tissue.

A further cause of increased production of both red and white cells may be (*b*) a heightened activity of the cytogenetic organs. Here, however, our ignorance of the natural process by which the blood corpuscles are made renders it impossible to say just what changes will accelerate their formation. It seems probable, however, that a general increase of nutrition may exert part of its influence on cell genesis by enhancing the vigor of the cell-generating organs; and a morbid stimulation of these organs is apparently the cause of the leucocytosis occurring in inflammation.

In the third place, an increase in the red corpuscles may be due to (*c*) any cause which will accelerate the transformation of the ill-developed primitive cells into fully-formed erythrocytes. Such causes, like those grouped under the preceding head, are to a great extent unknown, although the increase in blood cells and in hæmoglobin after the use of iron is probably to be referred to this category. A circumstance which complicates the consideration of this matter is that, in the spleen and bone-marrow, it is quite impossible to distinguish between the changes which must take place in order to produce leucocytes only and those requisite for their further transformation into red corpuscles. It is probable, as before remarked, that the latter process demands for its performance functional activity of a higher grade than does the former, and, unlike the former, can not be intensified by a morbid stimulus.

2. Causes tending to repress cell-formation include (*a*) deficient nutrition from any source. In this we have one of the most prolific causes of anæmia. It may be dependent upon the use of insufficient or improper food or the inhalation of air deficient in oxygen; it may be due to an-hygienic surroundings; it may occur as the sequel of organic or functional disorder of the alimentary tract or any of the accessory organs of digestion and assimilation (liver, pancreas, lacteals, or thoracic duct); it may result from changes in the heart or vessels, rendering the blood supply inefficient; and, finally, it may be traceable to nervous influence, as in the chlorotic and insane. In all these conditions an insufficient quantity of formative material is furnished to the cytogenous organs. In some cases, perhaps, the material is lacking in quality also, in that it contains too little iron to serve the purposes of cell genesis.

Secondly, (*b*) diverted nutrition may explain the absence of proper cell-formation. Under this head we include all forms of morbid waste by which materials which should have gone for the nutrition of the body are discharged unused or are employed in supporting some foreign growth. Such waste is seen in exhausting sweats and diarrhœa, in albuminuria and diabetes, in profuse expectoration and ptyalism, in continued suppuration, and in the development of tumors, especially if malignant. All material so misused is as if it had not been introduced into the body, and the waste is equivalent to a system of starvation, which has its effect upon the corpuscles as well as the rest of the economy.

In the third place, (*c*) deficient performance of function by a cytogenous organ may be the reason for the decreased production of corpuscles. This, again, may be due either to defective nutrition or to actual disease of the organ.

Furthermore, (*d*) the cytogenous organs, instead of having their function lessened in power, may perform it imperfectly, so that the white corpuscles alone are formed, and their transformation into the red corpuscles is not effected.* Thus a decreased activity of the blood-elaborating organs may produce an actual increase in the number of white cells; and it is probable that many cases of leucocythæmia are explainable on this supposition.

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* In treating of this part of our subject we have assumed that the red corpuscles are produced directly from the white, but the pathological statements here and elsewhere are equally applicable to the opposing view, that both originate independently from the same primitive cell. In either case the white corpuscle is to be regarded as the less stable and less developed organism, and one which requires less initial power to start it into existence.

3. Excessive destruction of the corpuscles may be due to several causes. (*a*) The cell-destroying organs, the liver, spleen, and marrow, may act with unusual vigor. This increased activity may be associated with structural changes in these organs, or it may be dependent on nervous influence. But we do not know what kinds of morbid stimuli may be applied to these organs to enhance their destructive power, nor what are the distinctive changes which are evidence that such stimuli have been acting.

(*b*) Again, a general increase in tissue-metamorphosis, by increasing the functional activity of each corpuscle, shortens the term of its existence and hastens its death. For we regard the erythrocytes as capable of doing just so much work, whether the time allowed for its performance is long or short. Although this view may not be absolutely accurate, it is still evident that if an excessive demand is made on the corpuscles they can not last as long as when working within physiological limits. Hence, in excessive muscular or nervous exertion, in excessive glandular activity, and in conditions of pyrexia, the tissue-waste, by throwing too heavy a burden on the oxygen-bearing cells, accelerates their destruction. Moreover, in febrile conditions the corpuscles themselves share in the increased activity of tissue-metamorphosis, and are hence used up more rapidly.

(*c*) The corpuscles themselves may become less resistant to destructive influences. It is quite supposable that, like the various organs of the body, the blood cells may vary in their susceptibility to morbid stimuli in different individuals, and in the same individual may acquire an unnatural proneness to disease as the result of debilitating agencies.*

(*d*) Nearly akin in its nature to the cause just mentioned is the power which some substances possess of destroying the corpuscles by simple contact while circulating in the blood. Such substances are water, acids, dilute alkalies, carbon dioxide, ammonia, chloroform, ether, arseniuretted hydrogen, carbon bisulphide, the biliary salts, chlorate of potassium, and pyrogallic acid. † Glycerine has no effect if injected directly into the vessels, but, if placed in the circumvascular tissue, withdraws the salts from the blood and renders that fluid so watery that the corpuscles are dissolved (Murri).

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* This seems to be substantiated by the experiments of Lépine, who found that in disease the resistance of the corpuscles to the dissolving action of water was diminished.

† Arseniuretted hydrogen, Eitner, "Berl. klin. Woch.," May 3, 1880; carbon bisulphide, Hermann, quoted in von Ziemssen's "Cyclopædia," Vol. XVII; pyrogallic acid, Neissner, "Berl. klin. Woch.," November 24, 1879.

Extreme cold and heat are also efficient in breaking up the corpuscles, the former agent being probably the more powerful. The application of heat and cold, or of the substances mentioned above, produces not only a condition of acute oligocythæmia, but also a state of the blood in which fragments of corpuscles and free pigment abound (microcythæmia, melanæmia). Calabar bean and the salts of silver are said to have an effect somewhat similar, although very much less marked.* Such a condition of the blood is to be distinguished from the forms of chronic anæmia due to the long-continued use of many drugs, such as the alkalies, the mineral salts, the sulphites, iodides, and bromides. These agents diminish the number of corpuscles either by a depressing effect upon nutrition or by increasing tissue-metamorphosis. They have, therefore, no direct destructive action upon the blood cells, although many members of this class, the metallic salts for instance, are said to combine with the red corpuscles and to circulate with them in the blood.

(*e*) Finally, the loss of corpuscles may be occasioned by a direct escape from the vessels ("traumatic anæmia").

4. Causes which retard the destruction of the blood cells are (*a*) deficient performance of destructive function by the liver, spleen, and marrow. It might seem as if there would be little harm in this arrest of dissolution; but when we consider that the worn-out erythrocytes are incompetent to perform their proper function, and probably impede by their presence the action of younger cells, we perceive the necessity for their removal. Moreover, if Quincke's † ideas are correct, the old corpuscles still contain the iron which is required for the formation of new ones, and if the former are not destroyed the birth of the latter is prevented.

(*b*) Retardation of the transforming power in the spleen and marrow. This, as we have already seen, produces an increase in the white corpuscles at the expense of the red.

(*c*) A general decrease in tissue metamorphosis, such as occurs especially in fat, plethoric subjects who take little exercise. Here the work of the corpuscles is diminished, and hence it may be carried on for a longer time before the power in the corpuscle is used up.

5. Alterations in the chemical constitution of the corpuscles are chiefly seen in diminution of the hæmoglobin or impairment of its function. This may be due to (*a*) deficient formation of the red corpuscles, and so primarily to insufficient or diverted nutrition;

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* Bartholow, "Materia Medica and Therapeutics," New York, 1879.

† "Dtsch. Arch. f. klin. Med.," November, 1880.

secondarily to imperfect cytogenesis, especially marked by a failure to appropriate iron. Or it may be due to (*b*) the action of poisons which either diminish the carrying power of the hæmoglobin or combine with its oxygen. These have already been given; they comprise hydrogen, carbon monoxide, nitrogen dioxide, nitrite of amyl, nitro-benzol,* and hydrocyanic acid, which act in the first way; and quinine, the potash salts, nitrogen monoxide, and sulphuretted hydrogen, which act in the second way. The introduction of these agents into the blood lowers the functional value of the hæmoglobin, and is practically equivalent to an actual diminution of the latter ("toxic anæmia").

Alterations in the physical properties of the corpuscles are chiefly (*a*) assumption of amœboid movement by the red corpuscles, due to the effect of a high temperature (relapsing fever), or to the action of disturbing chemical agents (bacteria); † (*b*) increase in amœboid movement of white corpuscles, due, probably, to recent formation and the possession of a large amount of unstable protoplasm; (*c*) decrease of amœboid movement in white corpuscles, due either to the action of drugs (alcohol, carbolic acid, hydrocyanic acid, quinine) or to unknown causes, as in leucocythæmia.

6. Alterations in the amount of plasma may result from (*a*) the reception of fluid into the vessels, the ordinary source of this additional supply being, of course, the alimentary canal, although in many cases, as after hæmorrhage, reabsorption takes place directly from the tissues. Or they may result from (*b*) an abstraction of fluid from the vessels, which may be dependent upon hæmorrhage or upon sweating, diarrhœa, polyuria, salivation, or, again, upon dropsical or inflammatory transudation. As already pointed out, these alterations are of importance in modifying the symptoms due to the corpuscular changes alone.

General Symptomatology.—The symptoms of lesions of the blood cells are very complex, and require to be classified in order that we may gain a clear idea of their character and relation. We shall, therefore, consider them in the following order:

1. Symptoms referable to the causal lesion. These, as constituting the initial evidences of the disease, are naturally the first to claim consideration. We may recognize two great classes of this variety of symptoms: first, those seated in disturbances of nutrition; secondly, those relating to the cytogenous organs. The first set comprises all the train of symptoms connected with indigestion and mal-assimilation: changes in appetite, nausea, vomiting, intes-

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* Von Ziemssen's "Cyclopædia, American Supplement."

† Dowdeswell; Arndt.

tinal disturbance, abdominal pain, loss of strength, general emaciation, and the multiform nervous phenomena associated with these conditions. The second set comprises localized pain over the spleen and over bones which contain diseased marrow; and an enlargement of the spleen and lymphatic glands, either forming a perceptible tumor or declaring itself by the signs of the pressure exerted upon neighboring organs.

2. Symptoms directly indicative of a destruction of the red corpuscles are found chiefly in the abnormal disposition of the hæmoglobin. This may be discharged unchanged in the urine (hæmoglobinuria), or may be converted into pigment resembling that of the bile, and so circulate in the blood (hæmatogenous jaundice).

3. Symptoms referable to changes in the quantity or quality of hæmoglobin. Here may be classed such objective signs as the pallor of anæmic conditions and the ruddy hue characteristic of true plethora. But such signs are of little account as evidence of changes in the corpuscular state, since they are largely dependent upon differences in the total amount of blood and upon altered vaso-motor action. Much more important are the symptoms which indicate a depreciation of the power of the hæmoglobin as an oxygen-carrier, and, hence, as an efficient agent in maintaining the nutritive processes. Whenever either the quantity of the hæmoglobin is diminished or its quality deteriorated, the corpuscles are unable to carry as much oxygen as before, and, therefore, fail to satisfy the demands of the tissues. Hence the attacks of dyspnœa, which are evidence of the unsatisfied cravings of the system for oxygen. Hence, also, the important changes which take place in the nutrition of all the tissues. These changes may be limited to diminution of function, or they may go on to absolute degeneration of structure. They affect the brain and nerves; and there result headache, faintness, vertigo, tinnitus aurium, disturbances of vision, attacks of unconsciousness, and even delirium and convulsions. They affect the vascular system, and as consequences are seen a fatty heart, which works with deficient power, and a degeneration of the capillary coats, such as to allow of the exudation of serum, or even of the extravasation of blood. They affect the gastro-intestinal tract; and there appear all the manifold symptoms of a dyspepsia, which helps to increase the general mal-nutrition. And, in general, they affect all the tissues and organs of the body, lowering their working capacity and causing them to take on a diseased action, by starving them of their oxygen. Although these results are seen especially in the different forms of anæmia, they also

occur in leucocythæmia, either because there is an absolute decrease of red cells in this disease, or because the excess of white cells interferes with the performance of function by the red, or because the enormous development of white corpuscles represents an amount of misapplied energy whose loss for the purposes of nutrition tells severely on the system.

4. Symptoms referable to a change in the total blood volume. The importance of these has already been indicated. It is probable that many of the disturbances mentioned in the foregoing paragraph, especially those proceeding from the brain, are partly to be referred to such alterations in the volume of the fluid circulating through the affected part. Variations in this respect cause differences in vascular tension which can not fail to react on so sensitive an organ as the brain. That this influence is a potent one is shown by the effects of transfusion after hæmorrhage; in which a fluid that, like milk, contains no hæmoglobin, but serves to restore the normal intra-vascular tension, gives as good an immediate result as blood itself.*

A direct effect of changes in the volume of the blood is seen in the pulse and in the action of the heart. When the total volume is too small, the heart endeavors to make up for the deficiency by driving the blood more rapidly through the organs, and hence there results a pulsation which is frequent, and may be irregular and intermittent, or may give rise to a sense of painful palpitation. The pulse also becomes frequent, feeble, and of diminished volume. In the opposite state, when the amount of circulating fluid is excessive, the heart's action becomes more powerful in order to force the superfluous mass through the capillaries, and the pulse becomes full and strong.

The amount of fluid has also an important bearing on the possibility of transudation. It is not, indeed, probable that a mere state of hydræmia will cause dropsy, if the nutrition of the blood-vessels remains unimpaired. If, however, the oxygen-starvation consequent upon a poverty of corpuscles or of hæmoglobin depresses the vitality of the capillary walls, the latter yield more readily to the increase in internal pressure caused by the increased volume of blood. Exudations, therefore, take place in hydræmia, not because the capillary walls are more permeable to watery blood, but because the nutritive constituents of the blood are relatively diminished and the intra-vascular tension is heightened. These exudations may occur as a diapedesis of the corpuscles; or as an effusion of serum into the connective tissue or the serous cavities; or as a transudation of all the elements of the blood into the subcutaneous tissue, into the submucous tissue of the respiratory, alimentary, and genito-urinary tracts, into the subserous tissues, and into the retina. Dropsy and œdema are very common, especially in the latter stages of fatal diseases of the blood. Hæmorrhage is also common, the most usual species being the intra-retinal; although epistaxis, petechial extravasation, and, indeed, all varieties have been witnessed. In some cases the tendency to bleeding amounts to a hæmorrhagic diathesis.

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* A still more striking instance is the well-known one of the frog, whose life is maintained for several days, although all the blood in his body has been replaced by a simple saline solution.

5. Symptoms referable to the exudation of cell elements. Diapedesis of the corpuscles, whether occurring from the reasons just described or as a result of inflammatory action with local stasis, produces a marked effect upon the circumvascular tissues. The exuded corpuscles may accumulate in sufficient quantities to form pus, and thus give rise to the familiar symptoms of abscess or of purulent infiltration. Or, if poured out in less numbers, they may organize and form new tissue, as in the ordinary process of repair. Or they may excite irritation in the surrounding structures and cause the development of peculiar new formations. In this way is explained the occurrence of new growths of adenoid tissue in leucocythæmia—considerable diapedesis taking place, the extravasated leucocytes produce a degree of irritation which results in the formation of a connective-tissue network enveloping the cells. A similar process of exudation and subsequent irritation is doubtless the cause of the retinitis which is observed in leucocythæmia and in pernicious anæmia.

6. Symptoms referable to altered tissue-metamorphosis. In most of the conditions in which the number or the functional activity of the blood corpuscles is diminished the deficient oxygenation of the tissues is signalized by the existence of a subnormal temperature. In many such cases, however, in spite of the paucity of oxygen-carriers, a rise in temperature occurs, indicative of increased tissue-metamorphosis. Such an occurrence of fever in anæmic conditions and in leucocythæmia has been variously explained. Immermann * believes that it is due partly to retention of heat by diminution of the cutaneous circulation, partly to the heat developed in the degenerative processes going on in the tissues, by which unstable albuminoid matters are converted into stable substances (fat, etc.). Perhaps in some of these cases the increased destruction of the corpuscles themselves may be accompanied by the development of heat.

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* Von Ziemssen's "Cyclopædia," Vol. XVI.

General Diagnosis.—The diagnosis of diseases of the blood cells is effected partly by recognition of the symptoms above recounted, partly by examination of the blood itself. To perform this examination thoroughly requires the determination of the following points:

1. The total volume of blood. Unfortunately, it is difficult with our present means of examination to estimate this with accuracy. There are at present two methods in use. One, employed by Quincke, consists in the transfusion of blood with a numeration of the corpuscles before and after the operation; the increase of corpuscles in a cubic millimetre, compared with the total amount of blood injected, shows to what degree the latter has been diluted in the blood already existing in the body.* This method is, however, scarcely applicable to the human subject except when transfusion is being employed for other purposes than those of diagnosis.

A second means of estimation is that of Tarchanoff,† who produces copious sweating by means of the vapor-bath, and, having calculated the loss of water from the difference in body weight before and after the operation, assumes that this entire loss falls upon the blood serum. This being granted, it is easy to see how an estimation of the hæmoglobin before and after the bath would show how much fluid has been withdrawn from each cubic millimetre of blood, and hence how much blood the whole body contained.‡ This method, again, would probably be too exhausting to subject a patient to merely to arrive at a diagnosis, although it may be applicable when the bath is already in use as a therapeutic means. Objections which have been made to the assumption upon which the method is founded have been met by the author, and, as it appears to us, in a satisfactory manner. It may be noted that it is essential to the success of the plan that the subject should drink no water during the operation, or for some time before it.

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* Let a = the No. of corpuscles in a cu. mm. of injected blood.
b = the No. of corpuscles in a cu. mm. of subject's blood before operation.
c = the No. of corpuscles in a cu. mm. of subject's blood after operation.
v = volume of injected blood in cu. mm.
x = volume of subject's blood in cu. mm.

Then $a\,v + b\,x = c\,(v + x)$, and $x = v.\dfrac{a - c}{c - b}$

† "Arch. f. d. ges. Physiol.," xxiii, xxiv.

‡ Let x = the total amount of blood in a cu. mm.
v = amount of fluid lost in a cu. mm.
a = amount of hæmoglobin in a cu. mm. before operation.
b = amount of hæmoglobin in a cu. mm. after operation.

Then $a\,x = b\,(x - v)$, and $x = v.\dfrac{b}{b - a}$

2. The number of corpuscles, red and white, in a cubic millimetre of blood. A numeration may be accomplished most readily, perhaps, by Malassez's modification of Gowers's hæmocytometer. (See Fig. 3 in the July number of this journal.) In the use of this instrument a single determination is hardly sufficient; in order to insure accuracy each count must not only embrace a number of the squares in the cell, but must be repeated several times with each specimen of blood. With these precautions the probable error of an observation may be reduced to one per cent., or even less, while without them it may rise considerably above ten per cent.* It is important also that the blood in repeated examinations should be drawn from the same spot, since its corpuscular richness varies in different parts of the body.

3. The quantity of hæmoglobin in a cubic millimetre. The estimation of this may be accomplished by any of the chromometric methods. Perhaps the best of these is either that which depends upon the use of the spectroscope or that employed by Bizzozero. (See Fig. 7 in the August number of this journal.) It must be mentioned that when there is an excess of white corpuscles in the blood the chromometric methods are not applicable till this excess has been removed. This can be effected by adding a few drops of a caustic soda solution. Leichtenstern,† who recommends this device, says that the difference in absorptive power before and after the addition of the reagent is roughly proportional to the degree of leucocytosis, and in this way the number of white corpuscles may be estimated with sufficient accuracy for clinical purposes when a microscope is not at hand.

4. The occurrence of distortions in shape, inequalities in size, nucleation of the red corpuscles, and anomalies of amœboid movement. All such phenomena are to be noted in the microscopical examination.

It may be stated here that the condition of the blood cells may become a means of diagnosis in diseased conditions which are not directly dependent upon alterations in the blood. Thus, incipient suppuration may be diagnosticated by the sudden appearance of an increased number of white corpuscles. In this way the conversion of a simple pleurisy into an empyema has been made out.‡

General Prognosis.—The prognosis of any disease affecting the blood cells will depend partly on the cause, partly on the extent of the lesion, and partly on the severity of the symptoms. An ordinary symptomatic anæmia usually disappears with the cure of the disorder of nutrition to which it is due. On the other hand, a severe traumatic or toxic anæmia may be speedily fatal from the direct effect of the failure of blood function. Pernicious anæmia and leucocythæmia are in themselves very dangerous, although not absolutely incurable, maladies.

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* Lyon and Thoma, "Arch. f. path. Anat. u. Physiol. u. f. klin. Med.," lxxxiv, 1, 1881.

† "Untersuchungen über den Hämoglobulingehalt des Blutes," Leipsic, 1878.

‡ Gabel, "Lyon Méd.," August, 1880.

General Therapeusis.—In the treatment of diseased states of the blood the causal indication is first to be regarded. This may be fulfilled in several ways. If, for instance, the general nutrition is at fault, our obvious duty is to remedy this defect by appropriate diet and hygiene, by exercise and travel, and by appropriate treatment of nervous troubles. If it is the cytogenetic organs which are disordered, therapeutic agents may be applied directly to them. Thus, in the enlarged spleen of leucocythæmia the external application of electricity and the cold douche, the internal use of quinine and eucalyptus, and the employment of parenchymatous injections have all been recommended with the view of reducing the size of the organ. So, also, in those cases of myelogenous leucocythæmia which appear to depend upon injury to the long bones, the treatment of the latter condition must be the first topic of consideration.

We have to fulfill a more specific indication when there is either decreased supply of the peculiar materials designed to form the corpuscles, or an imperfect appropriation of these materials by the blood-forming organs. Here the great remedial agent is iron. We have seen how this substance, although forming a very small proportion of the red corpuscle, is the one thing necessary for the performance of corpuscular function. Accordingly, a diminution in hæmoglobin is important merely because it signifies a diminution in the amount of iron; and the symptoms dependent upon the former condition can be relieved by making good the deficiency in the latter constituent. The administration of iron in anæmia, therefore, acts by supplying to the blood cells just the material which they need for their full development and the performance of their function. Under its use both the hæmoglobin and the number of red corpuscles are increased. The latter result is probably due not so much to a direct stimulation to the formation of new erythrocytes as to the reception by ill-developed cells of a material which completes their growth. In anæmia there are probably in the cytogenous organs many such half-grown forms, which by the addition of iron become recognizable as erythrocytes, and as such are passed into the blood. In health, when these forms are not abundant, the use of iron does not materially increase the number of red corpuscles. Iron may also increase the production of erythrocytes in a secondary way, by first enriching the cells which already exist and increasing their power of carrying oxygen; in this way it improves the nutrition of all the tissues, and with them that of the cytogenous organs, and so excites the latter to more vigorous action. To manganese has been ascribed the same property as belongs to iron, with which it is frequently prescribed; but it is doubtful if it has such an effect at all. Other drugs which increase the number of erythrocytes probably do so by improving digestion and assimilation. Such are the vegetable bitters, arsenic, and, perhaps, phosphorus and mercury in small doses.*

In cases where the diminution in hæmoglobin or in oxidizing power takes place very suddenly, or is very extensive, the action of iron is too slow to remedy the deficiency in season. In such cases transfusion of blood has been employed. The success attending this operation has not, however, been very encouraging, and it is brought in only as a last resort in desperate cases of traumatic, toxic, and pernicious anæmia.

We may wish to check the amœboid movements of the white corpuscles, as, for instance, when we desire to restrain diapedesis in inflammation. Quinine, alcohol, and carbolic acid have this power when added to the blood outside of the body; but the quantities required are such as could not be administered internally without toxic effect. It is possible, however, that the subcutaneous injection of quinine may suffice, by its local action, to prevent diapedesis and suppuration.† Probably a more efficient means of attaining the same result is by the use of agents which diminish the vascular caliber. Such agents are, cold locally applied, and various drugs taken internally. Opium is thought to owe its power in inflammation to its effect on the vascular caliber (Bartholow).

The symptomatic indications in diseases of the blood cells must, of course, be very diverse; and it is quite beside our purpose to detail here the various remedial agents which they may call for.

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* Keyes, "Am. Journ. of the Med. Sci.," January, 1876; Wilbouchewitz, "Arch. de Physiol.," 1874, have both asserted that mercury in small ("tonic") doses increases the number of red corpuscles; but the experiments upon which these conclusions are based have been invalidated (Leichtenstern, *loc. cit.*, who also cites Caspary to the same effect).

† Yet even in this case, according to Appert, "Arch. f. path. Anat. u. Physiol. u. f. klin. Med.," lxxi, p. 364, a quantity must be introduced exceeding $\frac{1}{8000}$ of the body weight, or in a man of ordinary size more than two drachms.

(*To be continued.*)

THE PHYSIOLOGICAL AND THERAPEUTICAL ACTION OF ERGOT.

By ETIENNE EVETZKY, M. D.

(*Continued from August number.*)

Part II.—The Physiological Action of Ergot.

Local Action; Systemic Action; Acute Ergotism in Animals and Man; Chronic Ergotism in Animals; Spasmodic and Gangrenous Ergotism; Treatment of Ergotism; Action of Ergot on Tissues, Organs, and Functions: Nervous, Muscular, and Other Tissues, Heart, Blood-Vessels, Blood Pressure, Intestines, Bladder, Uterus, Iris, Glands, Temperature, Respiration, and Nutrition; Action of Ergot on the Fœtus; Systemic Effects of Therapeutic Doses; Condition of Ergot in the System, and its Elimination; Relation of Ergot to Other Remedies.

Local Action of Ergot.—Ergot, according to Mialhe, has no chemical effect on *tissues*, except that of coagulating albumen. Applied to the *skin*, protected by the epidermis, it does not produce any apparent effect. But on raw surfaces, wounds, and abraded skin, it acts as an irritant, and very soon induces an unhealthy suppuration, and at times even mortification. Introduced *under the skin*, it leads to the formation of abscesses containing ill-smelling pus. The crude drug alone acts in such a manner; ordinary extracts properly diluted are nearly bland. Applied to *bleeding surfaces*, it stops the hæmorrhage. If a small quantity of the powder be taken into the *mouth*, its acrid taste and irritant properties tend to increase the flow of saliva, soon replaced by a feeling of dryness in the throat. In the *alimentary canal*, ergot in small doses does not produce any appreciable effect; but, if larger quantities (20–30 grains) be taken for any length of time, the feeling of dryness will be more marked, to which is added a sensation of constriction; salivation is increased, yet the thirst is very marked. Digestion is soon disturbed—the tongue is coated; the patient suffers from nausea, eructations, and vomiting; an oppressive feeling in the epigastrium is complained of; and frequently diarrhœa sets in. If still greater quantities be taken, as in the cases of criminal use of the drug, we find the mucous membrane of the entire alimentary canal, particularly that of its upper part, very much injected, and even spots of erosion may be present. In the *cellular tissue* the extracts, and also sclerotic acid, produce pain, sometimes inflammatory swellings running into suppuration, but more commonly temporary indurations with the signs of irritation. Of course in this case, as with all remedies, the extent of the local process depends greatly upon the state of the vitality of the tissues. The pain caused by the hypodermic injections is due, according to Buchheim, to the acidity of the fluid, and it is well to neutralize it. The *muscular tissue* is less apt to give these unpleasant results, and for this reason it should be the favorite place for the hypodermic administration of ergot. Ergot is at times given by the *rectum*, and, as a rule, it is borne well, only occasionally suppositories cause a feeling of burning. If they are introduced late in the evening, patients suffering from sexual debility are apt to have seminal emissions.

Systemic Effects of Ergot.—The experiments of Schrübler and Zeller* would tend to indicate that ergot has a poisonous action on vegetable and also on the lower forms of animal life. According to Nikitine,† cold-blooded animals are affected by ergot more than warm-blooded animals. The herbivora show greater tolerance of it than the carnivora (Wright,‡ Nikitine). Block# gives numerous instances of cows and sheep consuming enormous quantities of ergot for a long time with impunity, which may be due to the presence of tannic acid in the food. Its systemic effects depend upon the quantity taken and the length of time the system has been subjected to its influence. We will study first the general manifestations as seen in cases of poisoning, and then examine in detail and separately the specific actions of ergot on different organs and functions.

Toxicology. — Usually two forms of ergotic intoxication are described—the acute and chronic varieties; but in the case of man three forms of ergotism should be distinguished—acute, sub-acute or spasmodic, and chronic or gangrenous ergotism.

Acute Ergotism.—This can best be studied in *animals*, after injecting some fluid preparation of ergot into the blood-vessels. S. Wright states that immediately there are noticed dilatation of the pupils, great increase of the pulse rate, hurried respiration, evacuation of urine and fæces, a fall of temperature, unconsciousness, anæsthesia, and various motor disturbances, such as convulsions, paralysis, tetanus, and tremulousness—the animal dying rapidly with the symptoms of general paralysis. If a very large quantity of ergot be introduced into the stomach, the phenomena of poisoning develop more gradually and are less intense. In this case there are superadded also symptoms of local irritation—vomiting, diarrhœa, etc. A small quantity produces at first excitement, followed by depression, from which the animal, as a rule, recovers entirely. In

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* Pereira, "Materia Medica and Therapeutics," Phila., 1854, ii, p. 136.

† *Op. cit.*

‡ *Op. cit.*

Pereira, *op. cit.*

view of the importance of this topic, I will transcribe the description of Wright's Experiment IV:

> A solution furnished by half an ounce of ergot was slowly injected into the femoral vein of a large bull-terrier bitch weighing twenty-three pounds. About half an ounce of the fluid was propelled at once, to each of which injections the system answered by very increased arterial action and quick, hurried respiration. The first injection also produced violent convulsive movements of the whole body, but the hind legs were chiefly affected. The urine and fæces flowed abundantly, and the animal cried in a plaintive and agonized tone. The convulsions lasted for about three minutes, when the dog became still, the whole frame relaxed, being totally insensible to pain. The pupil was dilated and motionless, the action of the heart scarcely audible, the respiration slow and profound. In eight minutes the pulsations of the heart became distinct, and the respiration was hurried and difficult. In four minutes more sensibility returned to the anterior part of the body, and the animal moved its forelegs; the posterior extremities remained motionless and insensible. The pupils were excessively dilated, and the eyes glared hideously. Sight and hearing were, however, restored, for the dog watched my movements, and was startled by a sudden or loud noise. At this period the body was cold; in a short time the sensibility of the forelegs was again lost, the eye became fixed and glazed, the motions of the heart were feeble and quivering, and a rattling in the throat announced the period of dissolution. A little diluted spirits was now poured down its throat, which seemed to operate as by enchantment. In a few seconds the breathing became free, the motions of the heart accelerated, the energies of the system were revived, and, as if invested with new life and vigor, the animal in a minute or two was upon its legs, followed me when called, but whined piteously from the wounds on its surface, of which it was now sensible. The forelegs were moved with perfect freedom; the hind ones were not fairly lifted, but dragged along. It thus continued for about a quarter of an hour, when paralysis again returned, and, increasing progressively, terminated the function of animal life in exactly one hour and thirty-five minutes from the first injection.

He concludes, from a series of well and carefully conducted experiments, that ergot in large toxic doses affects chiefly the brain and the spinal cord; that both may be influenced together, or the spinal cord be attacked first; that in a concentrated form ergot paralyzes the system instantly, no resistance to its effect being discernible; milder preparations cause for a time great excitement, the nervous energy is roused, but sinks eventually under the influence of the poison; a much diluted solution, on the contrary, produces at first no apparent effect, but seems by a very progressive sedative action to deprive the system of its energy and so to exhaust it of life.

In *man* we see usually only the moderate forms of acute poisoning, and, as a rule, in pregnant women, the victims of criminal practice. By reason of idiosyncrasy, even ordinary therapeutic doses may show the same marked toxic action. In severe cases we observe a train of symptoms resembling in its essential points acute ergotism in animals, only in a milder degree. The patient is attacked by nausea, retching, eructations, vomiting, colic, and diarrhœa. Salivation is present, as a rule. The pupils are usually dilated, but may be contracted. Severe headache and giddiness ensue, and the sight is impaired. The patient manifests dejection and weariness, and complains of great muscular exhaustion. The pulse is weak, slow, and irregular; the arteries are relaxed and easily compressed; the skin is livid, indicating venous congestion. The respiratory movements are less frequent, with dyspnœa, and the temperature, as a rule, falls below the normal. In some cases severe neuralgic pains may be present. Drowsiness merges into stupor, the patient dying comatose.

Post-mortem examinations reveal, in animals, highly-marked venous engorgement, especially in the abdomen and cranium; the alimentary canal exhibits the signs of irritation; the bladder is generally distended, but may be well contracted. Autopsies in man are rare, and, as the cases are complicated with other conditions, there is little to be learned from the reports.

Chronic ergotism in animals assumes a form somewhat different from that of man. Wright, feeding dogs on food mixed with ergot, noticed them grow duller from day to day; they were thirsty, the appetite became impaired, and the digestion disturbed. They lost flesh; acrid tears destroyed the hair on the face; the sight and hearing failed, paralysis of motion and sensation making its appearance pretty early, being more marked in the legs. In some cases hyperæsthesia could be observed. The pulse became feeble and slow; the breath was fœtid, and the breathing was difficult; the stools and urine passed involuntarily; the temperature was reduced; and the animals died from exhaustion and paralysis in the sixth or seventh week.

On post-mortem, the muscles were found flabby and pale; the heart was full of dark blood; the bronchial and intestinal mucous membranes were injected and inflamed. The lungs of some of the animals contained tubercles, and some of the joints purulent collections.

Tessier, feeding pigs on ergotized food, observed the same effects as Wright; but he mentions also the occurrence of gangrene, which never took place in Wright's experiments.

Bonjean, Gross, and others fed fowls in like manner. The combs and wattles grew bluish-black, cold, hard, and brittle, and frequently ulcerated. Black blood flowed from the nostrils, and the plumage was shed.

Chronic ergotism in man presents itself either as raphania, "Kriebelkrankheit," spasmodic ergotism, or as gangrenous ergotism. Although the first has been observed mainly in Germany and Russia, and the second in France, we can not explain the differences of the toxic manifestations by the difference in the source of the poison. It is true that a number of French epidemics were induced by maize ergot, but we know that its action is identical with that of rye ergot. If we compare the symptoms of all three varieties of ergot disease, we shall notice a certain relationship between them. In the acute form we find exclusively grave nervous manifestations of a paralytic nature. These nervous disorders hold a very unimportant place in gangrenous ergotism, nutritive lesions being its prominent feature. Spasmodic ergotism occupies a middle ground. We find here certain nervous symptoms, paretic as well as irritative, but of a milder type than those of the acute form, and also nutritive disorder, never reaching the intensity that it does in gangrenous ergotism.

It would appear, then, as if these three forms of the disease represented three different degrees of ergotic intoxication. This becomes still more evident if we compare the clinical course of the spasmodic and gangrenous varieties. The first supervenes earlier after the exposure, its course is more rapid, and death results from it sooner than in gangrenous ergotism. On the other hand, its symptoms resemble to some extent those of the mild acute poisoning, and may justly be considered as those of a subacute form of ergotism. In Germany and Russia, where the peasantry are poor and ergotic disease of the rye is more common, we naturally find a severer form of poisoning than in France, where the hygienic conditions are more favorable. Orfila * states that gangrenous ergotism is more apt to occur under prolonged exposure to the action of ergot.

Spasmodic Ergotism. †—The first symptoms of the disease show themselves usually in a few days after exposure, and this may occur as early as the fourth day. It begins with a peculiar feeling of tingling and formication in the tips of the fingers and toes; and this may extend over the whole body. This is the first symptom to appear and the last one to pass away. The formication may increase, and there may be even actual anæsthesia. Vomiting and diarrhœa, with severe colicky pains, soon set in. A peculiar feature of the disease is intense hunger, which is probably a symptom of irritation of the gastric mucous membrane. Then comes on a feeling of discomfort, anxiety, and weariness, and of giddiness and unrest. The patient complains of distressing oppression in the epigastrium, severe headache, usually frontal, vertigo, noises in the ears, stupor following dizziness, and at times insomnia. The limbs may be stiff, and, as the result of the reflex centers of the spinal cord being affected, convulsive contractions of various groups of muscles may occur, frequently excited by the slightest touch, or apparently involuntary in character. They may pass into continuous contractions, which particularly affect the flexors. These cramps may last a variable length of time, are very painful, and are followed by a state of utter exhaustion. The convulsions may be very extensive, tetanus and epilepsy may occur, and even cataleptic conditions have been observed. In animals one-sided rotatory movements have been seen. As the disease advances, the convulsions become more frequent and general, but, sooner or later, paralytic phenomena occur in the sphere of motion, sensation, and reflex movements. The pupils are contracted or distorted, the eyes are fixed, the skin is bathed in cold perspiration, the urine is suppressed or only retained by the spasms of the vesical sphincter. The pulse is slow, weak, and irregular. In severe cases the patient loses the power of sight, hearing, and speech. He may become unconscious or delirious. At this stage the face is pale and sallow, the surface of the body is cold, and, as the convulsions occur, with increasing paralysis of the heart, the disease is closed by death, which may occur as early as the third day. The occurrence of blindness may be preceded by various visual disturbances—colored and doubled vision, photophobia, hemiopia, periodic amblyopia, and hallucinations. The latter in the sphere of other senses are not uncommon.

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* Orfila, "Toxicology," translated by J. Nancrede, Phila., 1817, p. 351.

† Von Ziemssen's "Cyclopædia," xvii, p. 904.

This train of symptoms would place spasmodic ergotism in an intimate relation to the acute poisoning; the difference is accounted for by the fact that the system is not entirely overpowered, and the opportunity is afforded for the development of those specific nervous disorders which are peculiar to this substance. But, as the disease may last sometimes from one to two months, and very seldom lasts less than two weeks, we may observe in some cases also trophic disorders. About two weeks after the beginning of the disease pustules and even furuncles may appear, the fingers may be attacked by whitlows, and the nails may be diseased toward the close of the month. It is not very uncommon to meet with gangrenous processes in different parts of the body. Should the patient recover, the nervous symptoms gradually subside, and, after a protracted convalescence, a complete recovery may take place; but at times permanent lesions may remain—stiffness of the joints, paralysis, muscular weakness, tremor, epilepsy, imbecility, optic disorders, etc. The post-mortem appearances are the same as in the acute and chronic poisoning of animals.

Gangrenous Ergotism.—In the beginning of the disease we find some of the symptoms of the spasmodic form, but they are less severe and not so marked. We may have violent cutaneous irritation and other disorders of the sensitive nerves. Symptoms referable to the cerebral nervous system are met with also—headache, dizziness, occasional contractions of the flexors, and disturbances in the sphere of the organs of special sense. Retching, nausea, vomiting, and diarrhœa appear early in the disease. But the specific symptoms of gangrenous ergotism, although they may make their appearance in a few days, do not usually show themselves until two or three weeks later. The part to be affected grows cold, and the feeling of cold may be intense; then erysipelatous redness spreads over it. The epidermis is soon raised by serous exudation; after the latter has escaped, the denuded surface appears gangrenous, and dry gangrene rapidly develops. During the first part of this process there is a good deal of pain, but later on the part becomes insensible. As a rule, the gangrene is dry, but in some cases the moist variety may be seen. The parts that are usually affected are the toes and the feet, less frequently the fingers and hands, in some cases the nose and the ears. As a rule, the gangrenous process is limited, but in some cases it may extend to the trunk. Cases are on record in which all four extremities were attacked and destroyed. We have to expect a severe drain on the system, and the condition is aggravated by the absorption of the poisonous matter. In the course of the disease the patient suffers from a low continued fever; phthisical symptoms may develop. Death results from exhaustion, pyæmia, or septicæmia. If the gangrenous process be not very extensive, the patient may recover; otherwise the prognosis is unfavorable. The disease may last several months.

Autopsies do not reveal anything different from what is to be expected under the circumstances. Barrier asserted that the arteries leading to the gangrenous region were diseased, but Bonjean and others have found them normal.

Treatment of Ergotism.—In all cases further introduction of ergot into the system should be arrested, and that which is already in the alimentary canal should be removed as speedily as possible. Griepenkerl recommends the use of tannic acid, but it can be of benefit only if ergot is present in the stomach and intestines. Cardiac and nervous depression should be treated by stimulants. Alcohol exerts a very beneficial action even when there are grave paralytic symptoms of acute ergotism. Spasms and muscular pains must be treated by anodynes, electricity (central and local electrization), warm baths, and friction. Von Boeck recommends, properly, the use of nitrite of amyl to relieve the spasms of the arterial system. A supporting and stimulating regimen will meet the remaining indications. A perfect drainage of the ichorous discharges should be established in conjunction with the usual antiseptic dressings. Blood poisoning, if present, is to be treated as under other circumstances.

ACTION OF ERGOT ON TISSUES, ORGANS, AND FUNCTIONS.—In the preceding pages we have made ourselves familiar with the general aspect of the action of ergot on the system. All the essential features of its physiological action have been referred to, and it remains now to examine each in detail to complete this part of our subject.

Action of Ergot on the Nervous Tissue.—From the description of the ergotic intoxication, it is evident that the nervous system is profoundly affected by ergot. We must determine how it manifests itself, and what parts of the nervous system are acted upon by the drug.

a. Nervous Centers.—There can be no doubt that their function is very seriously influenced by ergot. In fact, the greatest part of the symptoms of ergotism is due either to their paralysis or to their irritation, with subsequent paralysis. It is important to decide if these symptoms are due to the direct action of ergot on the nerve cells or to the primary disturbance of the circulation within the cranium and the vertebral column. That the latter plays a very important *rôle* in the evolution of ergotic symptoms, there can be no doubt. We find in the experimental pathology and pathology of nervous diseases many facts demonstrating the great dependence of the ganglionic functions on their blood supply. But to follow the example of Stillé and Maisch * by ascribing all the nervous disturbances caused by ergot to the altered circulation would be to commit a grave error. The fact itself that the circulation is influenced by ergot speaks in favor of its direct action on the nerve centers (vaso-motor ganglia), and there is no reason why we should doubt the possibility of other centers being also similarly affected. It is true that the task of discriminating as to the immediate cause of a great many ergotic symptoms, if taken separately, is almost impossible. Still we can not admit that such a train of symptoms as is observed during the rapidly fatal cases of acute ergotism can be caused alone by the interference with the circulation. Outside of ergotism, simple anæmia or vascular relaxation can cause headache, dizziness, drowsiness, stupor, delirium, mania, various functional disturbances in the sphere of sight and hearing, nausea, vomiting, paræsthesia, various motor disturbances, etc. And in the case under consideration we may ascribe them to the same cause. But these symptoms are far from exhausting all that is seen in poisoning by ergot, and, what is more, it is safe to assume that the above-enumerated symptoms are intensified by the direct action of ergot on the nerve cells involved in their manifestations.

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* Stillé and Maisch, "National Dispensatory," Phila., 1879, p. 536.

On the other hand, there is a group of symptoms which can not be so readily connected, if at all, with the changes in the blood supply. Here belong those referable to the motor centers of the spinal cord, the cerebral and peripheral vaso-motor ganglia, the cardiac centers, the motor (contracting) centers of the iris, etc. Various trophic disturbances (ulcers, gangrene, etc.) are also most likely due to the trophic centers being affected by ergot. As to the motor centers of the uterus, bladder, intestines, etc., the evidence is decidedly in favor of the direct action of ergot. This will be discussed more fully under the appropriate heads; it will suffice at present to conclude that ergot acts upon the nerve cells directly, in which it is assisted by the circulatory disorders. This action manifests itself as an irritation, or as an irritation with subsequent paralysis, and, when the quantity of the drug is great, as immediate paralysis. It is clear that ergot acts on all the nerve centers irrespective of their functions, but the motor centers of the inorganic muscular tissue appear to be influenced in a particularly prominent manner.

b. Nerve Fibers.—In deciding upon the mode of action of ergot on the nerves it is important to eliminate its influence on the cerebro-spinal centers. This can be accomplished by bringing the nerves into immediate contact with some fluid preparation of ergot, and otherwise excluding the influence of the centers. According to Köhler,* ergot diminishes the irritability of the *sensitive nerves.* Nikitine, who experimented with sclerotic acid, finds that the peripheral ends of the sensitive nerves are paralyzed by it. Köhler states that the *motor nerves* are similarly affected by Bonjean's extract, while Wiggers's ergotine produces the opposite effect. Nikitine did not notice any effect on the motor nerves from the use of sclerotic acid, and Haudelin † does not think that the nerves are affected by ergot at all, the symptoms being due to the central influences. It is evident from the foregoing that the action of ergot on the nerve fibers is not a very pronounced one, playing, in fact, a subordinate *rôle*.

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* Virchow's "Archiv," lx, p. 384.

† *Op. cit.*

Action of Ergot on the Muscular Tissue.—The two varieties of muscular tissue, voluntary and organic, differ from each other in many respects, the essential difference consisting in their respective modes of innervation. The skeleton muscles are under the immediate control of the cerebral volitional centers. Their spontaneous activity is due to the spinal reflex centers, whose function is regulated by Setschenoff's inhibitory centers lodged in the medulla oblongata. So that the motor impulses are derived exclusively from the cerebro-spinal axis, with which the muscles are connected only by the conductors of the impulses. The organic muscular tissue is to a great extent under the control of the motor centers lodged within itself or in its immediate vicinity; the function of these centers is regulated by the centers located in the cerebro-spinal axis, which are not within the reach of volition. As to the muscular substance itself, although it differs in both cases materially from the standpoint of anatomy, physiologically the difference is slight and immaterial.

We must ascribe, then, the dissimilarity in the behavior of the two kinds of muscular tissue under the influence of ergot rather to the difference in their respective modes of innervation than to that of their structure. In fact, there is not the slightest evidence that ergot has any action whatever on the muscular tissue itself. This is very easily verified on the skeleton muscles. The motor paralysis does not appear until the stage of general paralysis is reached, while the preceding motor disturbances (convulsions, spasms, tremors, etc.) are due to the action of ergot on the spinal motor centers. In this all observers unanimously agree. Köhler, who studied this question very thoroughly, states that the type of the muscular contractions, as shown by Helmholtz's myographion, is not altered by ergot in the least; that the electro-contractility is not changed, and is the same before and after death. Nikitine also arrived at the same conclusions. Similar investigations with regard to the organic tissue are much more difficult on account of the intimate connection existing between the motor centers and the muscular tissue. This subject will be treated of more extensively when speaking of the action of ergot on the different organs composed of organic muscular tissue; we may say here that it is more consistent with the result of experiments to draw the same conclusion as in the case of the voluntary muscular system. In some cases there can not be the least doubt as to its correctness, and where the evidence is not so pointed there will be no reason not to adopt a uniform view.

Ergot has no effect whatever upon the remaining tissues. The glandular organs are acted upon by it through the medium of the nervous system and the circulation.

From the preceding pages we may conclude, then, that the *entire physiological action of ergot is based upon its action on the nerve cells in general, and on certain motor centers in particular, consisting in irritation, resulting in their paralysis if the quantity of the substance is great.*

(*To be continued.*)

THE NATURE AND TREATMENT OF THE OPIUM HABIT.

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Although inebriation by opium is not known to the people as alcoholic excess is, yet thousands have become infected with this ruinous propensity, which, unless it is pursued to excess or becomes complicated with grave diseases, rarely attracts attention, its concealment being generally so successful as to defeat inquiry. The individual who takes opium or morphine generally begins with small doses, and keeps the habit a profound secret from the other members of the family, and it is not until the irresistible craving has been thoroughly established that the patient's sense of shame at the vice to which he is a slave disappears, and he becomes lost to self-respect and self-control. He is now unable to live without his opium ; his constitution demands it, and he is only capable of discharging his duties and occupations by the artificial and temporary health imparted by his customary dose. Each dose restores for the time the strength and activity enfeebled by previous indulgence, but this effect soon fades away ; the fearful craving again appears, the patient soon weakly yields, his dull, unimpressive, sunken, lusterless eye becomes for a time clear, sparkling, and restless, the pale, haggard features become flushed as in youth, and the muscular system is restrung, so that the tremulous hand becomes steady and the tottering gait firm and assured. These contrasts are diagnostic of the opium habit, together with a peculiar expression of countenance, although the patient will generally deny that he ever takes opium. The amount that patients take daily differs very much. Several patients have written me lately that they are taking daily from two to seven or eight grains of morphia, while a physician of this city has just informed me of the case of a lady suffering from cancer who is taking 150 grains of morphine, equivalent to 1,200 grains of opium, daily. Coleridge took upon one occasion one quart of laudanum in twenty-four hours, while De Quincey took at the highest about 480 grains of opium daily. My experience with patients suffering from the habit has been that most of them assert that pain in some part of the body first led them to take opium and was the origin of their habit, and that subsequently the suffering, the sinking, the wretchedness and misery which attended abstinence from it induced them to continue indulgence in the drug.

The psychical effect of opium is very interesting. A professional gentleman recently under my care acknowledged to me that he voluntarily sought opium to impart calmness and indifference in the midst of domestic unhappiness, and perfectly succeeded, but acquired the fearful, irresistible craving for morphia, which it was very difficult to eradicate. He soothed his heartache, but he nearly ruined his brain. I have known of more than one patient who, I am satisfied, took opium primarily to mitigate mental suffering; others take it to get up an increased vivacity or brilliancy, while some literary persons, as was the case with De Quincey, imagine that they get a restorative and creative power from its use. The habitual use of opium seems to produce a peculiar type of moral insanity, leaving the intellectual centers of the brain untouched. The patient's views of right and wrong are perverted, and, while he may go on with his routine duties, either in public or in private life, he often manifests an utter disregard of truthfulness, honesty, and sincerity, and after a time shows a seeming inability to exert his will in any other direction or for any other purpose than the gratification of his morbid appetite. The use of opium tends to sterility and impotence, and to the extinction of the reproductive propensities. Hearing and vision are not unfrequently affected, and insomnia is very common. Tremors and an unsteady, ill-balanced gait are generally observed in all well-developed cases. Opium rather suspends the operations of the mind than causes disease; for it does not seem to act directly on cerebral structure. If it did, insanity would be the result, and I have never met with a case of mental disease that I could trace to indulgence in opium or morphine, and I have had many cases of this nature under my care.

The early use of the poppy is made known to us through the ancient mythologies of the Greeks and Romans. The Romans looked upon the plant as a gift from Ceres, and she is described as having a scepter in one hand and in the other the symbolic capsule. It was the ancient custom to paint Soranus as reposing upon a bed of snowy poppies. Catullus and Tibullus also mention this plant, while Homer speaks of the poppy as among the familiar garden flowers. Diodorus says that the women of Thebes were acquainted with an herb which, its alleged properties lead us to suspect, was the poppy. Pliny also understood its virtues, and Livy speaks of it as being in the gardens of Tarquinius Superbus, which shows that it was known to the Romans at least five centuries before the Christian era. Hippocrates was also well acquainted with its virtues. The *Nepenthes* of the Odyssey, and the ancient cordials, probably contained opium and also Indian hemp, which imparted the intoxicating and exhilarating inspirations to such beverages. Opium was used medicinally by the Greek physicians centuries before the Christian era, and Dioscorides and others describe the mode in which it was obtained from the capsules of the plant. In 1228 we find the use of opium mentioned by the physician to Pope Nicholas IV. It was sent afterward, with camphor, etc., as a present to royal personages; and in 1516 it had become an article of commerce. In a letter to the King of Portugal it is described as in great demand among the rich and noble people in Egypt and Cambay, where the consumption was limited only by the price. Its use as a luxury was communicated by the Arabs and Persians to the other Eastern nations, and the rapid recourse to some form of opium was contemporaneous with the spread of Islamism. From being known in China as a medicinal substance in the ninth century, it has lately become a means of sensual indulgence, and constitutes a distinct and lucrative department of trade. About 3,000,000 Chinese smoke opium, and in the island of Singapore 15,000 out of a population of 70,000 are similarly addicted. It is recorded that, calculating the consumption of 299 smokers in Singapore, each smoker consumed what was equivalent to 50 grains of crude opium daily. When used to excess, it is said that 116 grains have been consumed in this manner. One hundred pounds has been stated to be the monthly supply for the opium inebriates of the island. The opium traffic with China is so immense that as far back as 1854 the Chinese paid the East India Company, for opium alone, a sum exceeding the total value of their exports of teas and silks together.

In China the opium used for smoking purposes is prepared with the greatest care from the crude gum, thus obtaining an extract or "Tschandú" which is about 54 per cent. of the original gum, and which yields more pronounced exhilarant and sedative properties, with a corresponding reduction of the narcotic element. In the region of the Bosporus there is used a confection of a lozenge form, and these lozenges are sold publicly. At Cairo a conserve is sold which, in addition to opium, contains hyoscyamus; while in India a similar confection contains Indian hemp or nux vomica. In Turkey the natives add to the gum opium ten per cent. of mercury, to intensify the stimulation. Morphine, the alkaloid of opium, contains the sedative property of opium, but the narcotic power is lessened, and it is therefore much used by ladies, especially in England. Laudanum is the spirituous solution of opium, and in China is limited to the higher classes, while with us it is used by the lower classes, to whom druggists are in the habit of selling a diluted laudanum for the purposes of drink. McMunn's elixir, which is a denarcotized laudanum prepared with ether, is much used; as is also paregoric, which is extensively taken by children of a larger growth than those for whom it was originally intended; while a well-known "soothing syrup," which, when analyzed, gives, I believe, *one grain of morphia* to the ounce of the liquid—thereby giving, if the directions on the bottles are followed, a great deal more than can safely be given to an infant—has succeeded in soothing many a little one into everlasting rest.

The effect of opium is invariably, although in different degrees, agreeable, soothing, stimulating, and elevating, culminating, as opium-smokers describe, in perfect bliss and complete oblivion. This state, however, is soon succeeded by languor, lassitude, loathing of food, aching of the limbs, gloom, and indefinable wretchedness, and these sensations are only relieved by increased indulgence, which gradually results in a complete degradation of the moral as well as the physical nature. The same curse of destruction of mental and physical health rewards alike the rich and the beggar. From the time when the indescribably entrancing repose following the use of opium occurs may generally be dated the bondage to the drug, which eventuates in ruined health, prostrated business, and blasted hopes. The action of opium suspends and permanently enfeebles volition and conscience. It would seem that the suspension and enfeeblement of the moral faculties produced by opium, while the intellectual faculties remain unimpaired, should depend rather upon a relation between opium and sensibility and consciousness than upon the relation which it has to cerebral substance. One very disagreeable symptom which opium-eaters suffer from is a general hyperæsthesia; and the painful nervous susceptibility often becomes so acute that even a jar from a footstep becomes unendurable; while the neuralgic twinges that result from opium shoot along the nerves until the unhappy sufferers are shattered—body and mind alike—from the prolonged torture. When a man has once yielded himself up to the mastery of this appetite, the soul becomes contaminated, the moral sense obliterated, and all the finer susceptibilities and nobler aspirations decline and fade away; the aim in life becomes erratic and purposeless, and the *habitué* has the misery and curse of seeing his children inherit the physical expression of general enervation and the mental aspect of dullness and idiocy. These children, with their feeble, broken-down constitutions, inevitably fill, as they grow up, our prisons, almshouses, and lunatic asylums. A great many infants who naturally inherit fairly good constitutions from their parents are poisoned by that Nemesis of the nursery, paregoric, and the early mortality of such children, with the records of post-mortems, reveals that this results in serous effusion of the brain, and in some cases even marked degeneration of the brain substance itself.

Opium is sometimes resorted to by literary men for the transient exaltation of the imaginative faculty; but the intellectual fire, which is regularly fed as it flags with stimulants and narcotics, will ere long die out, never to be relighted. One of the saddest things connected with this habit is the fact that voluntary renunciation of opium by one who has become addicted to its use is unknown to the profession. Opium-takers make many well-intentioned resolves toward reform, but they are invariably frustrated by a revival of the appetite, and a relapse follows. It is a startling fact, but a fact nevertheless, that one fifth of the opium sold by retail druggists would cover all the prescriptions of physicians in this country. Opium is taken generally to stimulate, but not to disturb, the mind; to soothe irritability; to induce placidity, pleasurable feelings, gentle and friendly relations; to restore the strength and activity enfeebled by previous indulgence, and to render the partaker himself capable of discharging his duties and occupations by imparting an artificial and temporary health, which at once deceives the victim and baffles the keenest scrutiny. A wan and withered man or woman will apply for treatment, with bent figure, slow step, tremulous hand, features pale and haggard, eyes sunken and lusterless, and the patient would appear to the ordinary observer as a man or woman tottering on the verge of life. Let such an one take his ordinary dose of a solution of morphine, and observe the result.

The transformation to a non-professional observer is something miraculous. The gait is firm and assured; the muscular system is restrung; the face has grown in roundness and fullness, and is flushed as in youth; the eye is clear, sparkling, and restless, and the conversation of our patient is cheerful and fascinating. But in a short time his rejuvenescence will fade away into the former spectral appearance. Opium is resorted to among the higher classes in our own country to blunt care, to dry the tears of grief, to calm the tremors of the terror-stricken, and lull clamorous consciences to the coveted rest. In addition to this, the wear and tear of our hurried life, and the nervous prostration so common among fashionable women, are temporarily relieved by this habit. There is a great deal of brain fatigue among professional and business men, resulting from the preponderance of waste over repair, which induces grave nervous prostration. This state of neurasthenia, or nervous exhaustion, is one of the most important predisposing causes of severe neuralgia, and these sufferers generally resort to opium or morphine to assuage the pain; and, as these attacks are not only severe but frequent, the opium habit is thus often insensibly acquired by repeated recourse to it to allay pain. In neurasthenia, or nervous exhaustion, the brain is irritable, and the patient is apt to become sleepless; and if a professional man not unfrequently resorts to morphine to obtain sleep, before he is aware of it he has acquired an irresistible craving for the drug which, even against his will and in defiance of it, has enslaved him.

I have found, as the result of excessive mental labor, anxiety, depressing mental emotions, hæmorrhages, and sleeplessness, a state of things which in women is associated with uterine displacements and spinal irritation, and in men with irritability, mental depression, and impending mental disorders. I have seen many cases of opium-eating developed among this class, as they are very prone to resort to opium for the temporary relief which they obtain from it. Modern nervous diseases are rapidly increasing and multiplying, and our morbid nervousness, which is developing itself in modern society, is making itself manifest by a great increase in neuralgia, sick headache, dyspepsia, and nervous exhaustion. Opium or morphine is too often the principal medicine or sedative resorted to in these cases to relieve pain or procure sleep, and, before long, those who resort to it habitually find that they can not live without it. As one lady expressed herself to me quite recently, the opium is taken, not because these persons want it, but to relieve the terrible sensations which attack them when they are without it, and they are thus forced deeper and deeper into a habit which they may honestly detest, because they can see no way out of the dilemma into which they have plunged themselves by their habitual use of opium to relieve nervousness. The opium *habitué* is thus an opium sufferer. When he awakes to a consciousness of his real position, it is pitiable in the extreme to know that this state can only be mitigated by new and perhaps increased indulgence. *There is probably no more terrible suffering* than the complete exhaustion, the prostration of mind and body, which these patients suffer. The control over the muscles is lost, and epilepsy, paralysis, and an unsteady and an ill-balanced gait are all frequent symptoms of this terrible disease. Such patients have a full consciousness of their position, but are powerless to emancipate themselves from the opium habit. Their miseries and anguish are extreme; but, in spite of all effort, they find themselves forced back again into the habit. It is just such cases that need medical aid and systematic treatment. There are no patients with any disease which more require to be lifted out from the depths of their suffering, and are in greater necessity of careful nursing, consideration, and attention.

Treatment.—The opium or morphine habit is a curable disease, as other diseases are, and I only desire to know that an opium sufferer honestly desires a cure to assure him that this result can be accomplished. If the opium habit is not eradicated, if the physician has the moral support of the patient in desiring a cure, it is because the treatment is at fault in some respect. I know of no disease that yields a better percentage of cures to the proper treatment. Primarily, the patient must put himself under the necessary control, and must, as I have said, desire a cure himself. The nervous system of most of our modern Americans is too delicate to bear the shock of a total deprivation of the opium at once. Grave nervous disorders follow such a course. In my own plan of treatment I employ a reductionary course of treatment, keeping the patient's nervous system quiet with a combination of the bromides, gradually *increasing* the bromides as I *decrease* the morphia, until, on the tenth day after admission, my patient is taking *no* opium or morphine, and has avoided all suffering and nervous prostration. I generally combine the bromides of ammonium and sodium, and eliminate them from the system, after I stop the opium, by warm baths, sweet spirits of niter, and digitalis. The reflex action of the spinal cord, which has purposely been kept depressed by the bromides during the reductionary treatment, is now excited by strychnia, and the central nervous system is stimulated and invigorated by the daily use of the induced or faradaic current of electricity employed as general faradization. Nerve tonics are also employed, and an emaciated patient generally gains in a month's time from twenty-five to thirty pounds of flesh; his shattered constitution is built up, and in from four to six weeks he is generally well enough to be discharged, and to resume his position in society, entirely free from all craving for opium or morphia.

Nothing but a thorough, systematic course of treatment can restore such patients to health, as there is no greater delusion than the belief in any specific to counteract the effect of opium or morphine in the human system and to eradicate the craving for the narcotic; and with such thorough, systematic treatment success is certain and invariable. One of the most interesting cases I have ever seen or treated was that of Colonel ———, an army officer, who had been addicted to the use of opium for thirty-five years, and who was treated in 1856 for it with no success whatever. He was fifty-three years of age. At the age of thirteen he went to China, and from there to India, where he discovered by experiment the fascination of the drug when eaten, and commenced the habit as a luxury. He was in the British army in India for twelve years, during which time he continued the habit until, in the year 1856, he had reached the amount of 200 grains daily. Previous to this time he had repeatedly endeavored to break off from the habit by voluntarily discontinuing the use of opium, but each time succumbed to the intolerable suffering which he experienced. He applied at this time for treatment to an Indiana physician, who failed to eradicate the habit or even to quiet the craving for opium. He therefore continued to take this dose of 200 grains of opium daily, although he felt convinced that it was impairing his mental faculties very markedly. The will power had become so enfeebled that the morbid impulse or craving impelled him irresistibly, regardless of all consequences. He served through the Mexican war, and also through the late civil war. During the progress of the war, feeling that his memory was failing rapidly, and that his physical health was being undermined, he reduced his daily allowance to 125 grains of opium per diem. He was so fearful of being taken prisoner, and thus losing his opium, that he carried about his person a small pistol, determined in the event of his capture to commit suicide rather than undergo the torture which the sudden deprivation of his stimulus would cause. This is a striking instance of the moral cowardice which this disease induces, as the patient was noted for his personal bravery on the battle-field. At the close of the war he commenced to take chloral as soon as he heard of its effect, hoping that he would be enabled to leave off opium. This, however, he did not do, but, continuing the opium habit, and the chloral in addition, soon reached the amount of half an ounce, or 240 grains daily. Upon his admission to Sunnyside he was on the verge of insanity, emaciated, feeble, pale, and anæmic, with a feeble gait, no appreciation of his condition or surroundings, hallucinations of sight and hearing, and delusions of fear and persecutions. Dr. William A. Hammond, of this city, who sent the patient to me, expressed the belief to the patient's wife that he would live but a day or two probably, and I thought so myself. As he was much excited, several doses of a combination of sodium bromide and cannabis indica were administered, also chloral and hyoscyamus, and toward morning he became quiet. The next morning he was partially aware of his condition, but excited, with rapidly changing delusions and hallucinations; he was given beef tea and milk in small quantities at short intervals. A bitemporal current from four cells of the galvanic battery was applied for some minutes twice in the day, with the effect of calming the excitement, and the same medicines were continued internally. The following night he slept a few hours; on the third day of treatment there was marked improvement. The bowels, which had been obstinately constipated for a long time, were opened by enemata containing turpentine, the intense restlessness and the delusions disappeared, and the patient expressed the desire to be cured, if possible, of his terrible craving for morphine, fully realizing his condition and conscious that death would result from the excessive use of chloral and morphine combined. From this time he was totally deprived of his chloral, and the morphine was gradually withdrawn; and after the withdrawal of the morphine the stimulating and tonic effects of electricity to the central nervous system, and the use of phosphorus, strychnia, and cod-liver oil as nerve tonics and nutrients, soon accomplished a complete and gratifying cure in what at first seemed a hopeless case.

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Editorial.

THE LONDON CONGRESS.

From the accounts which reach us we judge that the seventh session of the International Medical Congress, held in London in August, outranks in importance and brilliancy any previous gathering of the medical profession. A British and a German Prince, we are informed, took part in the formalities of the occasion. By so doing they honored themselves rather than medicine, to be sure; but, nevertheless, it can scarcely be doubted that their presence, together with the action of the Lord Mayor of London in entertaining some two hundred of the more prominent of those in attendance at the congress, must have gone far to lend impressiveness to the session in the eyes of the general public—an impressiveness fully justified, we may add, by the high character of the addresses given by the President, Sir James Paget, and others, including such men as Virchow, Sir William Gull, Erichsen, M'Clintock, West, Erasmus Wilson, John Simon, Spencer Wells, Billings, Huxley, Pasteur, Charcot, von Langenbeck, von Nussbaum, and others.

The speeches of these gentlemen were all admirable, and to single out any one of them for mention would be invidious, looking to their intrinsic merit alone. When, however, we think of the great effect which the words of such men, appearing as the representatives of a profession that seldom comes gracefully before the community at large, ought to have upon the laity, we can not but feel gratified that the choice for President of the Section of Public Medicine fell upon Mr. John Simon. In this department of medicine, as Mr. Simon truly said, not only are the public vitally interested, but they are also capable of following the steps in the processes by which workers in that field endeavor to arrive at principles. In one matter, indeed, it seems as if the sanitarians would have to bear the standard of the whole profession again, as they have so often done before. We refer to the protest of medicine against the virtual prohibition of vivisection now established in Great Britain. We are unwilling to believe that the anti-vivisectionists are all bigots, or even that the bigots among them have been able to furnish the power that has led to the enactment that now paralyzes experimental medicine in Great Britain. The greater portion of this power was doubtless derived from fair-minded men who naturally revolt at the barbarity they have been led to look upon as inseparable from vivisection. Such men need only good homely statements of facts, such as Mr. Simon brings forward, to secure their defection from the crusade into which they have been cajoled; and as for the fanatical leaders of the movement, their position, if Mr. Simon's words turn out to have the effect that seems justly predicable, will be that of creatures who have been urging a law for the protection of their own lives rather than of the lives of any lower animals.

Reviews and Literary Notes.

Bovine Tuberculosis in Man: an Account of the Pathology of Suspected Cases. By CHARLES CREIGHTON, M. D., Demonstrator of Anatomy in the University of Cambridge. With illustrations. London: Macmillan & Co., 1881. Pp. xi–119. [Price, \$3·75.]

IN view of our present state of ignorance as to the intimate nature and even the anatomical character of tubercle, the question of its transmissibility must be vexed for a long time to come before any definite conclusion can be reached. The uncertainty surrounding the subject has been increased rather than diminished by some of the very experiments intended to solve it, which, if they show anything at all, show that in rabbits and guinea-pigs—the animals most frequently selected—a pathological condition indistinguishable from tuberculosis is induced by inoculation with any substance whatsoever. Even in dogs, Schottelius found nodules apparently identical with miliary tubercle following the inhalation of non-specific matters; and in one of Virchow's experiments cheesy masses were discovered in the lungs and glands of a calf fed upon the milk of a cow which was supposed to be tuberculous, but was subsequently found to be only infested with echinococci. One by one the supposed histological characteristics of tubercle have been swept away or shown to be common to other formations, until pathology is left without even a "giant-cell" to stand on, and the latest *ex-cathedra* utterance of Cohnheim begs the question by abolishing all anatomical distinctions, and asserting that whatever induces tuberculosis (even in rabbits or guinea-pigs) must have contained a hypothetical tuberculous virus.

To the discussion of this vexed question Dr. Creighton contributes the carefully-analyzed record of a number of cases in which the identity of a certain form of tuberculosis in man with the "Perlsucht" of cattle is assumed on purely morphological grounds. Herein the author stands at issue with Virchow, and reverts to the views of Klebs, Bollinger, Orth, and others, who have held "pearl disease" and tubercle in cattle to be convertible terms, and insisted on the communicability of the malady to man through the flesh and secretions of infected animals. He draws, however, a marked distinction between the ordinary autochthonous human tuberculosis and the specific form derived from bovine infection—a distinction based upon the "structural mimicry" of the morbid products in the latter instance. Laying aside all attempts to trace the etiology of individual cases or to reproduce the infection by inoculation, Dr. Creighton says: "I rely solely upon the specific and distinctive character of the tuberculosis that affects the bovine species, and on the morphological identity that I shall prove between that kind of tuberculosis and the disease that occurred in the group of twelve cases in man."

In pursuance of this argument, a chapter is devoted to the pathology of the bovine disease, in which it is shown that the outgrowths from serous membranes—which alone seem to have attracted the attention of most veterinary observers, and which have given origin to the various names of "Perlsucht," "pommelière," "angle-berries," "grapes," etc.—are always accompanied by specific pulmonary lesions, and almost always by a peculiar implication of the lymphatic glands, chiefly of those of the thorax and abdomen, which often reach a great size. The single or grouped pulmonary tubercles are characterized by "a vascular periphery simulating a capsule" and a non-vascular center which undergoes calcification or softening, several adjoining nodules sometimes being excavated together and forming a vomica, commonly mistaken for a bronchiectasis—a mistake which the author broadly imputes to Virchow. The "crumpet-like" appearance of the lung, caused by numerous smooth-walled vomicæ of this sort, is regarded as of much diagnostic importance. "In the section of an enlarged gland numerous separate round nodules are found; externally also the individual glands have sometimes a nodular appearance from the growth of several independent centers within them. Schüppel found that the tubercles or nodules take origin at various centers in the follicular tissue, and that they do not arise either in the lymph-sinuses or in the substance of the trabeculæ. Like the tubercles in all other parts of the animal, those in the lymphatic glands contain numerous giant-cells." The liver, the intestine, the genito-urinary system, the joints, and the mammary gland are occasionally involved; in the latter situation, according to Walley, "the irritation of the tubercle gives rise for a time to increased functional activity of the gland, the secreted milk becoming contaminated with the tuberculous products, and propagating the disease to any animal (or man) which may be unfortunate enough to partake of it."

The cases in the human subject which Dr. Creighton ascribes to bovine infection are marked by the occurrence of what Rindfleisch describes as the "scrofulous tubercle," containing giant and epithelioid cells, and surrounded by a zone of increased vascularity; but particularly by the outgrowth from the serous membranes (especially on the sharp margins of the lungs and on the lower surface of the diaphragm) of nodules closely resembling, both in naked-eye appearance and microscopic structure, the corresponding "pearls" or "duck-weed" formations in cattle. The nodular deposits in the glands and the excavation of conglomerate pulmonary tubercles into smooth-walled, "crumpet-like" vomicæ, commonly mistaken for bronchial dilatations, are similar; the only clinical difference between the bovine and human forms of disease being usually a more acute course in the latter. Nearly all of the morbid phenomena here described have been noticed, even if misinterpreted, by other observers; our author claims credit only for separating them from the confused and conflicting mass of pathological data as etiological indications. The class of cases which he ascribes to bovine origin comprises "sudden and unaccountable onsets of tuberculosis both in children and in adults"; instances of tubercular peritonitis, tubercular pericarditis, and tubercular pleurisy; perhaps many of the so-called scrofulous affections of the lymphatic glands, joints, etc. The common view that a caseous lymphatic gland may be the starting-point of a secondary tuberculosis is disputed, and it is asserted that where such tuberculosis exists the glands are in the first instance occupied by tubercles which become caseous or cretaceous; their tuberculosis "is not the origin of the tuberculosis elsewhere in the body, but it is a coördinate part of a general infection"; and the morphological characters of the nodules on the serous membranes, in the lymphatic glands, and in the lungs "are such as to point to the specific disease which is indigenous in the bovine species as being the source outside the body from which the common virus has issued." Finally, Dr. Creighton is disposed to include certain examples of typhoid fever accompanied by flat nodules of the peritonæum as due rather to infection from the bovine "Perlsucht" than to the often-imagined accidental contamination of otherwise healthy milk.

There has been for some years past a growing consensus of scientific opinion as regards the communicability of tuberculosis, as well as of other maladies, from the lower animals to man, and a voluminous literature has already been accumulated on the subject. Dr. Creighton is, however, the first to attempt to point out the distinctive features of the communicated disease, and, although his argument lacks the essential link which should connect the recorded cases with the proven ingestion of tuberculous flesh or milk, the pathological evidence which he adduces has much *prima facie* value, and, at all events, he deserves gratitude for clearly defining a distinct group of cases for future study.

The plates illustrating the gross and microscopic appearances of the specimens examined are admirably executed.

Report on Trichinæ and Trichinosis. Prepared, under the direction of the Supervising Surgeon-General, by W. C. W. Glazier, M. D., Assistant Surgeon, Marine-Hospital Service. Published by order of Congress. Washington: Government Printing Office, 1881. Pp. 212.

The preparation of this report was instigated by communications received by the Department of State from several of our consular agents in different parts of Europe relative to the damage done to the trade in American hogs by rumors and assertions to the effect that such hogs were frequently trichinous. Numerous epidemics in different parts of Europe were said to have been traced to the consumption of American pork and hams. So careful an observer as Rokitansky's successor, Heschl, of Vienna, wrote a letter to the "Wiener medicinische Wochenschrift," in which he asserted that a careful examination of Westphalia hams showed that one out of 2,000 or 2,500 contained trichinæ, while a similar examination revealed their presence in one American ham out of every five or ten. He added: "The City Physician should not permit the sale of American hams that have not passed examination, and the public should be warned; and if you need my name, it is at your disposition." Soon after Heschl's letter appeared, Mr. Post, our Consul-General at Vienna, requested him to specify the German reports upon which his statement was founded. He then mentioned two German works, published four years previously, which do not appear to refer to the kind of ham recently imported into Austro-Hungary, and admitted that he had no personal knowledge of the subject, that he had never seen an American ham, and that he relied upon the examinations made in Germany. He subsequently examined some American hams by invitation of Mr. Post, and pronounced them sound. Similar reports, bearing official sanction, were circulated at Bremen, Dortmund, Mannheim, and other German cities. The Italian government prohibited the importation of American swine totally, as did also the Spanish government. In England similar reports gained ready credence, and invidious distinctions were made against our swine. In consequence of all this injurious excitement upon the subject of trichinæ in American ham products, Dr. Glazier was directed by Dr. Hamilton to report upon the subject of trichinæ in American pork and other meat.

The report which is before us is divided into seven sections, as follows: A. The History of the Discovery of Trichinæ Spirales. B. Their Natural History. C. Theories with regard to their Origin. D. History of the Disease caused by the Parasites, with accounts of Epidemics, its Etiology, Pathology, Symptoms, Diagnosis, Prognosis, Pathology, and Treatment. E. Symptoms observed in Animals, and Possibility of its Occurrence in Epidemic Form in Swine in the United States. F. Prophylaxis, including the Laws governing the Pork Trade in different parts of Europe, with some of the Results of the Examination of American and European Pork. G. Recommendations as to Methods and Precautionary Measures to be observed in Examinations. The writer claims but little originality, but with justice asserts that he has compiled his paper from a close study of exhaustive monographs written by careful observers and experimenters in different countries. He is inclined to believe that many of the assertions regarding American hams rested upon as slender a foundation as that by Professor Heschl quoted above, but he does not underestimate the importance of careful and systematic examination of swine products, and of due attention to the diet and hygiene of living swine with a view of preventing the origin of the disease. Numerous typographical errors, such as misspelled foreign names, etc., occur, and decidedly mar the appearance of the work, and the arrangement is not always systematic and logical, but the actual material furnished by the book is of a high order.

Lectures on Diseases of Bones and Joints. By C. Macnamara, F. R. C. S., England, Surgeon and Lecturer on Surgery at the Westminster Hospital, etc. Second edition. London: J. & A. Churchill, 1881. Pp. xii–551.

The first edition of this book, published three years ago, was devoted mainly to diseases of the bones, which were treated of in twelve lectures. In this volume of five hundred and thirty pages there are four additional lectures (two hundred pages) on the diseases of joints. In a previous number of this journal (May, 1879) we expressed great satisfaction at the teachings of the author on the subject of diseases of the bones, and we have only words of commendation for his manner of treating of the joint diseases. Without being exhaustive, and without any dry statistical information, he has given exceedingly clear pictures of different morbid conditions, aptly and sufficiently illustrated by cases from his hospital service, together with descriptions of pathological conditions interpreted by his own observations. His own opinions on disputed points are clearly stated, and the directions for treatment are precise and practical. We observe some additions to the lectures on diseases of bone (about fifty pages), the most valuable of which is a summary of our knowledge on the subject of fat embolism in fractures.

Diseases of the joints are considered under the heads "Synovitis" (serous, muco-purulent, and suppurative), "Scrofulous Synovitis," or "Granular Disease of the Synovial Membrane," "Chronic Osteo-arthritis," and "Ataxic Arthropathy." Then diseases of special joints are taken up. In regard to the pathology we observe nothing worthy of special notice, but have been struck with the fact that in diagnosis much stress is laid on differences of surface temperature. In the matter of treatment attention to the general health is considered of the very first importance, and, briefly stated, the local remedies are: For serous synovitis, rest and compression (together with anodyne liniments); for muco-purulent synovitis, the same, with strong counter-irritation; and for the suppurative form, prompt incision and drainage of the joint (with antiseptic precautions). Of excisions in general the author is no advocate, preferring, except at the elbow and shoulder, amputation of the limb after free incision and removal of diseased bone by the gouge or by drilling has failed to stay the progress of the disease.

It is gratifying to know that Mr. Macnamara has seen many cases of osteo-arthritis relieved by electrolysis. He recommends the continuous current, but insists on its being employed in the early stages of the disease. It is stated that about ten per cent. of patients with locomotor ataxy have joint complications, which begin with effusion into the synovial membrane and go on to destruction of the articular cartilages.

In regard to diseases of special joints we may mention that a sharp distinction is drawn between synovitis, epiphysisitis of the head of the femur, and chronic osteo-myelitis of the head of the femur, and their relative diagnostic features are presented. As a means of securing rest in the early stage of synovitis, the author has divided the rigid muscles subcutaneously, and prefers to use a Thomas's splint afterward. If the disease is progressing, he advocates incision into the joint. In chronic strumous osteo-myelitis he has practiced with much success the division of rigid muscles followed by drainage of the joint-cavity by drilling through the trochanter and head and neck of the femur. The limb is subsequently supported by Thomas's splint. This method we do not think has been much employed, and it seems to merit more extensive adoption.

But little space is devoted to diseases of the spine, and that to angular and lateral curvature. The plastic jacket is preferred to all other apparatus for maintaining rest.

A chapter on Sacro-iliac Disease and Coccyodynia closes the volume. We are told that excision does not always cure the latter trouble.

Imperfect Hearing and the Hygiene of the Ear, including Nervous Symptoms, etc. By Laurence Turnbull, M. D., Ph. G., Aural Surgeon to the Jefferson Medical College Hospital, etc. Third edition, with illustrations. Philadelphia: J. B. Lippincott & Co., 1881. Pp. xxii–9 to 147, inclusive. [Price, $2·50.]

What we have under notice is neither a systematic treatise on otology nor a series of monographs, but a jumble of prolix papers on a variety of subjects. The exuberance of the material is sufficiently indicated on the title-page. The book opens with an introduction, headed "Progress of Otology," and intended to give an account of recent advances. Much matter foreign to the scope of the chapter is here presented, e. g., a morning visit to Professor Politzer, who, we are told, is a little presbyopic; a letter from Dr. Cassels, of Glasgow, with his mode of treatment of catarrh of the Eustachian tube, etc. The investigations relative to the existence of trophic nerves for the tympanic structures are but incompletely considered, Gellé's experiments and those of Hagen (persistently called Hagan) being mentioned, while Berthold's more recent and very extensive researches are omitted.

In the chapter on Tinnitus the author states that the use of tobacco may produce functional disease of the ear. This may be true, but the cases narrated are not convincing. We cite the essential points of Case I (page 34): "*Tinnitus, the result of impacted cerumen and the excessive use of tobacco.*—A man who uses tobacco freely complains of deafness and tinnitus. On examination, both external auditory canals are found to be filled with cerumen. The wax is removed, the ears are inflated by Politzer's bag, and deafness and tinnitus disappear." We find no evidence against the tobacco, either in this case or in the other cases detailed to illustrate the direct action of the weed upon the organ of hearing. Page 38 contains the statement that the distance from the widest to the narrowest portion of the Eustachian tube measures *seventy-four millimetres*, evidently a typographical error.

According to the author, adenoid vegetations of the naso-pharyngeal space are of rare occurrence. In his practice he had met with but three such cases, and in his European travels he could not discover a single case at the clinics of Vienna, Paris, Edinburgh, and London. The fact is that the disease is *frequent* in childhood and *rare* in adult life, the vegetations disappearing spontaneously at or about the period of puberty.

In order to show that consanguineous marriages are not productive of evil, Dr. Turnbull quotes Scripture: "Abraham married his half sister Sarah; Abraham's brother Nahor married Milcah, his own niece, and Abraham's son Isaac married Rebekah, the granddaughter of Nahor; Isaac's son Esau married Mahalath, a granddaughter of Abraham, while Jacob, his other son, married Leah and Rachel, his own first cousins; Jacob's great-grandson Amram married Jochabed, his own aunt; and the results of this last union following these generations of consanguineous marriages were Moses the law-giver, Aaron the orator, and Miriam the prophetess." We fear that the conclusions drawn from a material so remote as to time and place hardly possess the scientific weight attributed to them by the author.

On the whole, we fail to detect in Dr. Turnbull's book anything that has not been expressed with more precision and clearness elsewhere, and, considering the high order of otological writing in this country at the present time, can not comprehend why three editions of this work should have been required.

Lectures on Diseases of the Nervous System, especially in Women. By S. Weir Mitchell, M. D., Member of the National Academy of Sciences, etc. With five plates. Philadelphia: Henry C. Lea's Son & Co., 1881. Pp. 238.

The title of this work is objectionable, for it does not properly describe the contents. Ten of these interesting and instructive clinical lectures are upon various forms of hysteria, some of them comparatively rare. There is also a lecture on the Chorea of Childhood, based upon two hundred and ten replies to a circular, distributed in the Southern States, asking for facts bearing on the relation of this disease to season of the year, weather, climate, locality, and race. Dr. Mitchell remarks that these statistics are incomplete and inconclusive, and perhaps fallacious. They are published, however, as too interesting to be laid aside—and perhaps because there did not seem to be anything else to do with them. The five "plates" in the work are elaborate charts or diagrams of the state of the weather, etc., during five years, shown in comparison with the prevalence of chorea and infantile palsy.

The next lecture is a brief one on what Dr. Mitchell calls "Habit Chorea," characterized by voluntary movements, or tricks, but sometimes ending in the ordinary involuntary form of the disease.

The concluding lecture will be read with special interest, for in it the author epitomizes to some extent his peculiar views, which have become familiar to the profession through his former writings, upon the beneficial effects of seclusion, rest, massage, electrization, and over-feeding in cases of hysteria. The experience of the seven years since his views were first published has served to confirm them in the main, and he takes this opportunity to indicate what changes he would suggest. He states that his method has stood the criticism and won the approval of many competent physicians. It might be added that it has also inspired them, and their patients, with gratitude to the distinguished originator of this efficient means of warfare upon an opprobrium of the profession. Dr. Mitchell can now say, after a careful review of many cases, that cure or amendment thus produced is quite as lasting as the cures of any nutritive defects obtained in ordinary ways, and he justly concludes that, exercise, tonics, out-door life, and change having been thoroughly tested first, there will yet be a novel resource remaining in this method; and no case of broken constitution, nervousness, or long-standing hysteria should be abandoned to invalidism till the plan has had a trial.

Books and Pamphlets Received.—A Treatise on Comparative Embryology. By Francis M. Balfour, LL. D., F. R. S., Fellow and Lecturer of Trinity College, Cambridge. In two volumes. Vol. II. London: Macmillan & Co., 1881. Pp. xi–655–xxii. [Price, $5·25.] ===== A Manual of Histology. Edited and prepared by Thomas E. Satterthwaite, M. D., of New York, President of the New York Pathological Society, etc., in association with Drs. Thomas Dwight, J. Collins Warren, William F. Whitney, Clarence J. Blake, and C. H. Williams, of Boston; Dr. J. Henry C. Simes, of Philadelphia; Dr. Benjamin F. Westbrook, of Brooklyn; and Drs. Edmund C. Wendt, Abraham Mayer, R. W. Amidon, W. R. Birdsall, D. Bryson Delavan, C. L. Dana, and W. H. Porter, of New York City. With 198 illustrations. New York: William Wood & Co., 1881. Pp. xiv–478. ===== Lectures on the Diagnosis and Treatment of Diseases of the Chest, Throat, and Nasal Cavities. By E. Fletcher Ingals, A. M., M. D., Lecturer on Diseases of the Chest and Physical Diagnosis, and on Laryngology, in the Post-graduate Course, Rush Medical College, etc. With 135 illustrations. New York: William Wood & Co., 1881. Pp. viii–437. ===== La Ceguera en España. Discurso leido en la sesion inaugural de la Academia y Laboratorio de Ciencias Médicas de Cataluña en el curso de 1880 á 1881. Por el Dr. D. Luis Carreras-Aragó, Profesor libre de Oftalmologia, etc. Barcelona: Los Sucesores de Narciso Ramirez y C^{a}, 1881. Pp. 51. ===== Sur l'Emploi de la Méthode Galvanocaustique dans le Nez et le Pharynx. Remarques présentées à la Sous-section de Laryngologie dans la 7^{e} session du Congrès International des Sciences Médicales (Londres, Août, 1881). Par Victor Lange. Copenhague: Bianco Luno, 1881. Pp. 14. ===== Ensayo sobre la Accion Fisiológica y Terapéutica del Jaborandi. Tésis para obtener el Título de Médico y Cirujano presentada y sostenida ante la Junta Directiva de la Facultad de Medicina y Farmacia por Abel Gutierrez. Guatemala: Tipografía "El Progreso." Pp. 45. ===== Chemical Analysis of the Urine, based in part on Casselmann's "Analyse des Harns." By Edgar F. Smith, Ph. D., Asa Packer Professor of Chemistry in Muhlenberg College, and

John Marshall, M. D., Demonstrator of Chemistry, Medical Department, University of Pennsylvania. With illustrations. Philadelphia: Presley Blakiston, 1881. Pp. 104. [Price, $1.] ═══ The Mother's Guide in the Management and Feeding of Infants. By John M. Keating, M. D., Lecturer on the Diseases of Children at the University of Pennsylvania, etc. Philadelphia: Henry C. Lea's Son & Co., 1881. Pp. 118. ═══ A System of Surgery, Theoretical and Practical, in Treatises by various Authors. Edited by T. Holmes, M. A. Cantab., Surgeon and Lecturer on Surgery at St. George's Hospital, etc. First American, from second English edition, thoroughly revised and much enlarged, by John H. Packard, A. M., M. D., Surgeon to the Episcopal and St. Joseph's Hospitals, Philadelphia, assisted by a large corps of the most eminent American surgeons. In three volumes, with many illustrations. Vol. I: General Pathology, Morbid Processes, Injuries in General, Complications of Injuries, Injuries of Regions. Philadelphia: Henry C. Lea's Son & Co., 1881. Pp. xxvi–35 to 1007, inclusive. ═══ Lectures on Digestion: an Introduction to the Clinical Study of Diseases of the Digestive Organs. Twelve Lectures, delivered to Practitioners and Advanced Students of Medicine during the winter session 1878–79. By C. A. Ewald, Lecturer in the Royal University of Berlin, etc. Translated by Robert Saundby, M. D. Edin., etc. New York: William Wood & Co., 1881. Pp. xii–149. ═══ Lectures on the Surgical Disorders of the Urinary Organs, delivered at the Liverpool Royal Infirmary. By Reginald Harrison, F. R. C. S., Surgeon to the Infirmary, etc. Second edition, considerably enlarged. New York: William Wood & Co., 1881. Pp. xvi–399. ═══ Manual for the Physiological Laboratory. By Vincent Harris, M. D. (Lond.), M. R. C. P., Demonstrator of Physiology at, and Casualty Physician to, St. Bartholomew's Hospital, etc., and D'Arcy Power, B. A., Oxon., Assistant Demonstrator of Physiology at St. Bartholomew's Hospital, etc. New York: William Wood & Co., 1881. Pp. 124. ═══ Dangers to Health: a Pictorial Guide to Domestic Sanitary Defects. By T. Pridgin Teale, M. A., Surgeon to the General Infirmary at Leeds. Third edition. London: J. & A. Churchill, 1881. Pp. xix–170. ═══ Cyclopædia of the Practice of Medicine. Edited by Dr. H. von Ziemssen, Professor of Clinical Medicine in Munich, Bavaria. Vol. XX. General Index. New York: William Wood & Co., 1881. Pp. 499. ═══ Treatment of Varicocele by Excision of Redundant Scrotum. Illustrated by New Instruments and an Account of Fifteen Successful Cases. By M. H. Henry, M. A., M. D., late Surgeon-in-chief to the State Emigrant Hospitals, etc. New York: J. H. Vail & Co., 1881. Pp. 27. ═══ The Prescriber's Memoranda. New York: William Wood & Co., 1881. Pp. 301. ═══ The Wilderness Cure. By Marc Cook, author of "Camp Lou." New York: William Wood & Co., 1881. Pp. 153. ═══ Transactions of the College of Physicians of Philadelphia. Third series, Vol. V, 1881. ═══ Medical Communications of the Massachusetts Medical Society, xii, 7, 1881. ═══ Proceedings of the Connecticut Medical Society, 1881. New series, ii, 2. ═══ Transactions of the Medical Association of the State of Alabama. The Report of the State Board of Health. Thirty-fourth session—1881. ═══ Minutes of the State Medical Society of Arkansas at its sixth annual session. ═══ In addition we have received a number of pamphlets, the separate acknowledgment of which is prevented by lack of space.

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Clinical Reports.

FROM PRIVATE PRACTICE.

STONE IN THE BLADDER; BILATERAL LITHOTOMY; SUBSEQUENT CYSTITIS, TREATED BY DRAINAGE.

Reported by S. P. Dennis, M. D., Salisbury, Md.

Mr. J. G. D., aged about twenty-five years, consulted me about the 1st of April last for stone in the bladder. His condition for undergoing an operation was very unfavorable, and the bladder was so irritable from chronic cystitis that it was difficult to sound for the stone. A large amount of pus was being discharged with the urine. In addition to the bladder trouble there was necrosis of the upper two thirds of the right tibia and fibula, and a number of sinuses were discharging.

On the 11th of April, after preparatory treatment for nearly two weeks, I proceeded to operate for stone by the lateral method. After the staff was withdrawn and the stone had been seized with the forceps, it became evident from the size of the calculus that it could not be extracted through the opening. I had nothing at hand to crush the stone with, and the only thing which could be done under the circumstances was to enlarge the opening by dividing the prostate on the right side. This I did by guiding the scalpel with the index finger of the left hand while cutting downward and outward with the right. Now I was able to remove with the forceps a stone weighing 2 oz., and measuring 1¾ × 2 inches in diameter. The hæmorrhage was profuse, and was controlled only by the use of persulphate of iron and lint, after the loss of so much blood as to endanger the patient's life. From this time no unfavorable symptoms arose until the wound was nearly healed, some three weeks after the operation. The bladder had been carefully washed out twice a day with a tepid disinfectant solution. I was assisted throughout the case by Dr. John S. Fulton and Dr. William A. Graham, former students of mine. As soon as the pus could no longer pass through the wound, symptoms of pyæmia set in—rigors, daily return of fever, and loss of appetite. Large doses of quinine were given, and every effort was made to keep the bladder free from pus by washing it out through a catheter passed by the urethra. Each washing brought away one or two tablespoonfuls of offensive matter. Still there was no abatement of the symptoms, and the patient grew worse each day. I was satisfied that something yet further must be done, or the patient must surely die. I believed it was not only necessary to free the bladder from urine and pus, but to keep it freed, before a cure could be hoped for. I passed a No. 12 gum male catheter through the incision into the bladder, taking care that the eye of the instrument was just inside the bladder, and secured it in this position by four tapes, in the same manner as the drainage tube is secured just after the operation, cutting off the portion of catheter below the tapes.

Nothing could have given more perfect satisfaction. Every unfavorable symptom abated, and in a day or two the lost appetite returned. The washing out of the bladder was continued for ten days, when the instrument was removed, and the patient was sent home cured of all traces of inflammation of the bladder. Some weeks after, he returned to my office complaining of a slight dribbling of urine, occurring at times while standing or walking about. For this I tried a mild current of electricity, but without effect. I then fused a little nitrate of silver on the end of a probe, and passed it through the fistula into the bladder. This was done some four weeks ago, since which time I have heard nothing from the patient, and I take it for granted that he is cured.

GASTRO-INTESTINAL IRRITATION IN AN INFANT, CAUSED BY SWALLOWING A PIN.

Reported by William G. Eggleston, M. D., Hampden Sidney, Va.

On June 26, 1881, I was called to see Charles C., aged nine months, who was quite fretful and feverish. Tongue red, with slight coating; pulse 130; temperature not taken. He seemed to suffer with sore mouth, frequently grinding the teeth and putting his hand to his mouth. There had been no evacuation of the bowels during the preceding twenty-four hours. Ordered the following: ℞ Hydrarg. chlorid. mit., gr. $\frac{1}{8}$; pulv. ipecac., pulv. opii, āā, gr. $\frac{1}{20}$; sodii bicarbonat., gr. $\frac{1}{2}$. M. Ft. chart. One such powder to be given every four hours. The patient was markedly better after taking two doses, but vomited the third, and no more were given.

On the 28th the patient was worse; vomited a good deal, and showed evidences of great gastric and intestinal irritation. He was ordered ℞ Bismuth. subnitrat., lactopeptin., āā, gr. x. M. Div. in chart. No. viij. S. One powder to be given every four hours, and to be repeated immediately if rejected by the stomach. A mouth-wash of chlorate of potassium (ʒ ss. to ℥j of water) was also ordered to be used between the doses of lactopeptine and bismuth.

On the 30th the patient had vomited only three times within twenty-four hours, and the evacuations were less frequent and more natural. There was no fever; pulse 124. He seemed more inclined to nurse, but the mouth was still quite sore.

July 1st.—The patient's bowels are loose, and the discharges dark brown. Pulse 130. No fever has been present during the past forty-eight hours, so far as the mother has been able to discover. Treatment continued.

2d.—Patient much better. The appetite is quite good. Pulse 116. The tongue is normal, and the child is in a profuse perspiration.

5th.—At 9 A. M. the child passed a common pin, $1\frac{1}{16}$ inch long, not bent, quite sharp, and marked by spots of corrosion along its shaft. The head showed several fine indentations, as if made by a knife-blade or a very sharp tooth (the child has six teeth). The discharge in which the pin came was of the consistence of gruel, and very black. The child was bright and cheerful.

The case is worthy of remark, because the treatment would have been different had there been any suspicion of the real state of affairs.

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Reports on the Progress of Medicine.

MONTHLY REPORT ON OBSTETRICS AND GYNÆCOLOGY.

No. IX.

By FRANK P. FOSTER, M. D.,
PHYSICIAN FOR DISEASES OF WOMEN TO THE OUT-PATIENT DEPARTMENT OF THE NEW YORK HOSPITAL.

Obstetrics.

1. Macdonald, A.—Quarterly report of the Royal Maternity and Simpson Memorial Hospital. "Edinb. Med. Jour.," Aug., 1881.
2. Knaggs, S. T.—Report of 660 cases of midwifery in Australia. [Dublin Obstet. Soc.] "Dublin Jour. of Med. Sci.," May, 1881.
3. Harris, R. P.—The practice of obstetrics among the Chinese. "Am. Jour. of Obstet.," July, 1881.
4. Bennet, J. H.—On hæmorrhage and excessive sickness during pregnancy; and on abortion, in connection with inflammation of the uterus and of its cervix. "Brit. Med. Jour.," July 9, 1881.
5. Stille, G.—Ein Fall von Retroflexio uteri gravidi. "Memorabil.," xxvi, 5, 1881.
6. Neville.—Two specimens of cystic degeneration of the chorionic villi. [Dublin Obstet. Soc.] "Dublin Jour. of Med. Sci.," May, 1881.
7. Lambl, D.—Ein seltener Fall von Hydramnios. "Centralbl. f. Gynäk.," July 9, 1881.
8. Coleman, W. L.—Abortion shortly after conception, and its prevention by viburnum prunifolium. "Therap. Gaz.," July, 1881.
9. Granniss, J. H.—Treatment of the third stage of abortion. "Proc. of the Connecticut Med. Soc.," ii, 2, 1881.
10. Budin, P.—Du diagnostic, pendant la grossesse, de la présentation définitive de l'extrémité pelvienne. "Progr. Méd.," July 2, 1881.
11. Mignen.—Arrachement total de la paroi antérieure de l'abdomen.—Issue des intestins et de l'utérus gravide de six mois. "Concours Méd.," July 23, 1881.
12. Polaillon.—Ablation de tumeur du sein pendant la grossesse. [Soc. de Chir., Paris.] "Rev. de Chir.," July, 1881.
13. Zinke, G.—The relief of pain during labor. [Obstet. Soc. of Cincinnati.] "Obstet. Gaz.," July, 1881.
14. Dougall, J.—Four unusual obstetric cases. "Glasgow Med. Jour.," July, 1881.
15. Roth, T.—Ungewöhnliche, seltenere Geburtshindernisse. "Memorabil.," xxvi, 5, 1881.
16. Brown, H. M.—A case of complete eventration of the fœtus in utero complicating labor. "Am. Jour. of Obstet.," July, 1881.
17. Gaston, J. McF.—Complications in cases of twins. "Am. Med. Bi-weekly," July 16, 1881.
18. Baranski, A.—Zwillingsgeburt mit einer Pause von 18 Tagen zwischen dem Austritte der ersten und zweiten Frucht. "Wien. med. Woch.," July 2, 1881.
19. Taylor, I. E.—Spontaneous version and evolution of the fœtus in shoulder and arm presentations, and the management of such cases without the sacrifice of the child. "Am. Jour. of Obstet.," July, 1881.
20. Griswold, R. M.—A plea for the more frequent use of the obstetric forceps. "Indep. Pract.," Aug., 1881.
21. Lowndes, H.—Suggestions as to the mode of using the forceps. "Brit. Med. Jour.," July 9, 1881.

22. Wasseige, A.—Essais pratiques du dernier modèle du forceps Tarnier. "Ann. de Gynéc.," July, 1881.
23. Kucher, J.—How to prevent rupture of the parturient uterus. "Am. Jour. of Obstet.," July, 1881.
24. Baker, M.—A case of Cæsarean section made necessary by two large fibroid tumors of the uterus, successfully performed for both mother and child. *Ibid.*
25. Perigal, A.—Cæsarean section. "Brit. Med. Jour.," July 16, 1881.
26. Reiche, P. H.—A case of complete inversion of the uterus occurring immediately after the second stage of parturition. "Med. Record," July 23, 1881.
27. Gill, H. Z.—Eclampsia. Puerperal convulsions. "Chicago Med. Jour. and Exam.," Aug., 1881.
28. Bush, J. F.—Puerperal convulsions; manual dilatation; version. "Boston Med. and Surg. Jour.," July 14, 1881.
29. Maberly-Smith, S.—On the treatment of puerperal convulsions by hypodermic injection of morphia. "Lancet," July 16, 1881.
30. Pietrzycki, M.—Case of puerperal metritis followed by abscess. "Pacific Med. and Surg. Jour.," July, 1881.
31. Rothe, C. G.—Beobachtungen an einem Falle von Puerperalfieber, zur Beleuchtung der Natur dieser Erkrankung. "Memorabil.," xxvi, 5, 1881.
32. Oppenheimer, L. S.—The prevention and treatment of puerperal mammary inflammations. "Indiana Med. Reporter," June, 1881.
33. Anderson, R. J.—Notes of a case of intra-uterine amputation. "Brit. Med. Jour.," July 16, 1881.
34. Plant, W. T.—Apnœa infantum. [Lecture.] "Obstet. Gaz.," July, 1881.
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6. Dr. Neville showed two specimens of *cystic degeneration of the chorionic villi* at a meeting of the Dublin Obstetrical Society, and gave an interesting account of the cases. ═══ In the discussion Dr. M'Clintock remarked that the disproportionate development of the uterus and the occasional watery or reddish discharges were characteristic of the disease, justifying a suspicion, if not a positive diagnosis, of what was going on *in utero.* In the majority of cases there was a total absence of any fœtal remains, but it was possible for a fœtus in the third or fourth month to coexist with very extensive cystic disease. In common with most writers, the speaker had always held that "hydatids" discharged from the uterus dated from conception, and he had never known of any well-authenticated fact supporting the idea that the disease might arise independently of pregnancy. ═══ Dr. More Madden believed it possible for a woman who had never had sexual connection to expel the so-called uterine hydatids; but, although a good many instances of the affection had come under his observation, he could not say that he had ever seen a case in which these growths were not the result of cystic disease of the chorion of a blighted ovum. Writers of unquestionable accuracy had recorded such cases, however, and he thought it not at all unreasonable to suppose that under certain circumstances the unimpregnated ovule might be arrested in its passage through the uterus and there undergo a monstrous development or vesicular degeneration. But in the great majority of cases hydatidiform moles were unquestionably the result of conception. Another question of interest arose—we were advised to bring on labor as soon as possible when assured of the existence of cystic disease in the uterus. This he thought bad advice. He had seen the expulsion of so-called uterine hydatids, the result of cystic degeneration of the ovum, followed, four or five months later, by the birth of a full-grown living child; so that, while its development went on, a twin conception must have perished in the womb. Hydatidiform moles might, therefore, coexist with natural pregnancy, and their existence, if recognized, should not induce us to interfere unless we were sure that the uterus did not contain another ovum at the same time; and, such nicety of diagnosis being impossible, we should leave these cases to Nature. ═══ The President (Dr. Byrne) could scarcely admit that vesicular moles had been observed in virgins. No doubt it occasionally happened that substances were expelled from the virgin uterus which were not unlike the product of conception, but on careful analysis proved not to be such; but the vesicular mole, or rather vesicular chorionic degeneration, was always the product of conception—could be nothing else, unless we were prepared to admit that the unimpregnated ovule in its Fallopian transit received a covering similar to that which the ovum, or impregnated ovule, received at its entrance into and its arrest in the uterus, viz., a chorionic covering. It was very difficult to come to any conclusion as to whether the degeneration was the cause or the effect of the death of the ovum. He had seen a good many cases of this affection, and he had one specimen in which large masses of vesicles were expelled, together with a compressed fœtus of six months. In this case it would appear as if, from some cause, placental formation had been going on simultaneously with chorionic degeneration, but that the latter proved victorious, and the fœtus died and was expelled; or this alternative explanation might be given: the fœtus died and remained in utero, and the placenta underwent degeneration of this vesicular kind and was subsequently expelled. He was inclined to think that the degeneration was the cause of the death of the fœtus; but the phenomenon was too remarkable to admit of the double explanation that it might be either the cause or the effect.

21. Mr. Lowndes thinks that in *the use of the obstetric forceps* it is important that traction should be made in the intervals, instead of during the pains. When the instrument is used before cervical dilatation is complete, and traction is made during a pain, the blades are tightly compressed between the head and the cervix, and, practically, we are tugging at both the child and the womb; and both the head and the cervix must then be in a most favorable condition for receiving injury from the blades. In the absence of regular pains he would wait a reasonable time between the acts of traction, as is generally recommended. Again, with the head high up, if traction is made during a pain the perinæum is apt to force the handles forward, and so prevent our pulling in the axis of the pelvis—a difficulty that is removed to a great extent by making the traction in an interval. If the pelvis is capacious, and only the opposition of yielding structures is to be overcome, the traction should always be gentle, and may generally be performed with one hand. With complete relaxation of the handles when they are not being used, and with no more pressure on them during traction than is necessary to prevent slipping, we need not fear injury to the head or to the mother even in very protracted cases. During the passage of the head through the vulva the forceps should be used, when necessary, as a restraining power during the pains, and labor completed by traction during an interval. This restraining action of the instrument is of special service when we have to deal with a damaged perinæum, perhaps with loss of substance imperfectly remedied by operation, also in all cases of first labor.

29. Mr. Maberly-Smith reports most gratifying success in *the treatment of puerperal convulsions with hypodermic injections of morphia.* The quantity to be injected is from a quarter to a third of a grain, according to the severity of the case. The simple solution is more efficacious than morphia and atropia combined, and one large dose is better than two smaller ones. Whether conscious or unconscious, patients with this affection appear to resist the dangerous effects of the drug; it seems to give rise to no bad consequences in cases in which, under ordinary circumstances, morphia would be decidedly contra-indicated. After an injection the patient may have one fit before the drug has had time to act, but never has another for hours, provided the dose is proportionate to the severity of the attack. If after some hours the patient has another fit, it is generally a slight one, and a smaller injection than the first should be given. No patient has died of puerperal eclampsia in the Melbourne Lying-in Hospital since this treatment was adopted, although several were in as bad a state as possible, and would have died, the author is convinced, under any other treatment. He gives brief notes of five cases. [This experience of Mr. Maberly-Smith's is strikingly in accord with that of Dr. C. C. P. Clark, as related in an article in the "American Journal of Obstetrics" for July, 1880, an abstract of which may be found in this journal for October, 1880, p. 409. The Australian writer uses less heroic doses than the American, but they can scarcely be called small. The experience of both may well lead to more importance being attached to the element of nervous irritation than it has generally been accorded.]

GYNÆCOLOGY.

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1. In a paper read before the Gynæcological Society of Boston, Dr. J. J. Campbell, of Baltimore, maintained *the capability of uterine lesions to induce sclerosis of the spinal cord and paralysis.* As summarized in the report of the meeting, the author argued that, as lesions of nearly every other organ and tissue might originate as a sequence to uterine disease, it could be assumed that the sclerosis in question might and did so originate. ═══ The general tenor of the discussion that followed the reading of the paper was to the effect that the relation between uterine and spinal disease was not established.

6. Dr. Mann opens his admirable article on *uterine electro-therapeutics* with some general remarks on the employment of electricity in medicine. The therapeutic value of the agent is liable to be underestimated, he thinks, on account of its reputed uncertainty, but this is largely due to imperfect recognition of its physiological effects, leading to an aimless and tentative mode of treatment. The matter would be much simplified were it not that many of the physiological effects of electricity have no counterpart in electro-therapeutics, owing to the impossibility of localizing the current. The paths of the current are determined by the relative resistances of the interposed tissues, which differ so that it is impossible to define the direction of the current or to localize it in any special structure, e. g., a nerve. Without insisting too much, then, upon the physiological side of the matter, a method of treatment founded on experimental research, checked by clinical observation, is likely to yield results vastly superior to mere empiricism. In some of the disorders of the female generative system electricity acts as an alterative to the nutrition of the organs concerned, mostly by virtue of its vaso-motor power, some aid being afforded by its action in promoting absorption. As an anodyne it is of great value in neuroses of the uterus and ovaries. As a stimulant it evokes uterine action, and under certain conditions provokes the immediate flow of the menstrual discharge. Its action must, therefore, vary with the nature of the disorder. Unfortunately, there is a prevalent idea that its legitimate sphere begins when other remedies fail, and that without any definite purpose it may be "tried" as a last resort. Moreover, the induced and constant currents are too often regarded as interchangeable, the selection being merely a matter of caprice. The constant current, in addition to its physiological effects, is largely endowed with chemical and thermal properties; in practice the latter may be disregarded, but there is reason to believe that the former may play a considerable part in modifying the functions of the animal economy. An allied property is its power of promoting osmosis and absorption, and of accelerating the movements of lymph in the lymphatics and lymph spaces. A further action of the constant current, that of aiding and hastening natural processes in some way not yet understood, can only be classed as catalytic. The principal physiological effect of the constant current, so far as concerns the subject under consideration, is exerted upon the vaso-motor system. The arterioles dilate, and the blood-supply is increased in the neighborhood of the electrodes, and also more or less in the entire region traversed by the current. The dilatation begins soon after the circuit is closed (being preceded by a slight contraction), and continues throughout the application and for some time afterward. Apart from this local effect, the current may act indirectly, i. e., on the vaso-motor center from which the nerves supplying a given vascular area are derived. Clinical evidence of this indirect vaso-motor action is difficult to obtain, and, to get the full effects, it is sometimes advisable to include the vaso-motor center in the circuit. Beyond this temporary effect on the blood-supply, repeated applications tend to diminish local blood stasis, and to restore the circulation of the part to its normal character. Such a renewal of impaired arterial tone seems to be the secondary result of stimulation—the vessels contracting on the subsidence of the dilatation at first induced. The anodyne effects of the constant current are not easily explained. Probably the immediate effect is due in some degree to a sort of polarization—the excitability of both motor and sensory nerves being lessened by their giving passage to a current of electricity opposed in direction to the nerve impulse. The secondary effect may be due to altered nutrition. Electrotonus, which has been cited as showing a sedative action of the anode and a stimulating action of the cathode on the sensory nerves, can scarcely clear up the uncertainty, owing to the insuperable difficulties met with in attempts to reproduce the physiological effects of the current clinically. Anodyne and stimulant effects are produced by both anode and cathode; any possible difference is only quantitative, the cathode being more stimulating than the anode. The primary effect of the induced current on the vascular system is to produce contraction of the arterioles, shortly giving place to dilatation. The increased blood-supply induced by the latter is further augmented by the movements of the skeletal muscles of the part. This hyperæmia, being produced indirectly, is less marked and of shorter duration than that brought about by the constant current. An important property of the induced current is that of stimulating the muscular structures of the womb, whether parturient or unimpregnated. The ultimate cause of the menstrual discharge is molecular degeneration of the mucous membrane of the body of the uterus. When the stage of fatty degeneration is reached, contraction of the uterus aids in determining the hæmorrhage by driving the blood from the parenchyma of the organ into the mucous membrane and rupturing the degenerated vessels. This explains how the induced current determines immediate hæmorrhage when its application coincides with the degenerative stage, and probably explains its failure to do so when used while the mucous membrane is in process of development, as the superficial vessels are then able to resist the increased blood pressure produced by uterine contraction. As shown by Röhrig, the center for uterine action is in the lumbar portion of the spinal cord, but stimulation as high up as the medulla, and even as far as the crura cerebri and optic thalami, also gives rise to slight uterine contraction, probably by indirect stimulation of the lumbar center.

A comprehensive view should be taken of uterine disorders, and electrical treatment resorted to only when the causative defect is centered in the generative system, the organism as a whole being healthy. The treatment often has to be prolonged, the association of electricity with rapidity of action holding good only so far as the physical side of the subject is concerned. It is useless to try to stimulate an ill-nourished or ill-developed organ to an immediate performance of its function without first having remedied the organic defect upon which the want of functional activity depends. Imperfect nutrition demands a prolonged use of the constant current; simple atony will probably be remedied by a much shorter employment of the induced current. The special instruments required in uterine electro-therapeutics are: an insulated sound (two sizes), a cervical electrode, and two or more large disk electrodes. The sound is of Sims's pattern, the curved part being thickly coated with gold, or preferably made of solid platinum, the gold having a tendency to peel off in adjusting the curve of the instrument to the obliquity of the uterus. The stem is insulated to within two inches and a half of the point by an elastic catheter; the amount of exposed surface can be lessened while the instrument is *in situ* by pushing the catheter along. The cervical electrode consists of a small concave metallic disk mounted on a stem, all but the concave surface of the disk being insulated. For the sake of uniformity it is always best to estimate the dosage by dix-millivebres. This also simplifies the galvanometric reading. After relating a case of congenital atrophic uterus in which electrical treatment was followed by the establishment of menstruation and an increased development of the uterus and the mammary glands, and referring to another of like sort, the author gives a case of secondary amenorrhœa. In the latter case vaginal examination revealed nothing abnormal. A current of from seventy-five to eighty dix-millivebres (about eighteen or twenty cells) was passed for ten minutes twice a week, the cathode being represented by an intra-uterine sound, the anode by a large disk placed over the ovarian regions. At the end of three weeks the induced current was substituted, the position of the electrodes being as before. The second application produced slight pain, followed by a profuse leucorrhœal discharge. After three weeks' suspension the use of the induced current was resumed. The second application was followed by a leucorrhœal discharge which in a few hours became tinged with blood. After a further interval of little more than a month the patient menstruated naturally and was afterward quite regular. In the treatment of amenorrhœa, the author remarks, electricity occupies a special position, being perhaps in many cases the only agent capable of affording the requisite stimulus to the uterus and ovaries. In all but the mildest cases it requires to be applied internally. In a case of severe menorrhagia, due to congestion arising from subinvolution and aggravated by the patient's laborious occupation, a current of from eighty-five to ninety dix-millevebres (about thirty cells) was applied for fifteen minutes twice a week, the cathode in the uterus and the anode on the lumbar spine. This was continued for several weeks with the necessary interruptions, and only once afterward was the menstrual flow excessive, and that excess was comparatively inconsiderable. In a case of spasmodic dysmenorrhœa, an exhaustive trial having been made of the ordinary remedies, the anode was introduced into the uterus, the cathode being applied to the lumbar spine, and a current of from seventy-five to eighty-five dix-millivebres was passed for ten minutes three times a week. The first subsequent period was unattended with vomiting (that had been profuse before), and the pain was greatly diminished. The treatment was pursued during the next interval with such marked benefit that the patient declined further treatment. The old-fashioned term "neuralgic dysmenorrhœa," says the author, still expresses all that is known of many cases of this disorder. In a uterus otherwise healthy there is an irritable condition of the mucous membrane of the cavity which, under certain circumstances, evokes painful, clonic contractions of the organ. When the sound reaches the uterine cavity the patient feels pain identical with that of dysmenorrhœa, the contact setting up irregular uterine action. In this form of the disease much relief is afforded by electricity, the result, probably, of altered nutrition and of the direct action of the current on the terminal nerves. Ovarian irritation or neuralgia, if not dependent on uterine disease, may be treated successfully with electricity. It is often sufficient to pass a current of eighty-five or ninety dix-millivebres by means of external electrodes, the anode being placed over the ovary and the cathode over the lumbar spine. If the accompanying dysmenorrhœa is urgent, it is preferable to introduce the anode into the uterus and apply the cathode over the ovarian region. The existence of oöphoritis is a contra-indication. In many cases the effect will be made more lasting by the use of a pill of one grain each of valerianate of zinc, valerianate of quinia, and valerianate of iron, twice a day. Some forms of subinvolution of the uterus are amenable to electricity. The exciting cause (retention of fragments of placenta or membranes, inflammation of the cervix from laceration or bruising during labor, and partial prolapse being the more common) should first be removed. To succeed with electricity, it must be used early, before the condition has passed into one of areolar hyperplasia. Unless contra-indicated, an insulated sound forming the cathode is introduced into the uterus, with the anode over the lumbar spine, and a current of about ninety dix-millivebres is passed for ten or twelve minutes every second or third day. During the first half of each application the current should be stable; during the latter half it may be interrupted at intervals in order to stimulate contraction. While the interruptions are being made it is well to reduce the strength of the current to avoid disagreeable shocks. The patient should maintain the recumbent posture for some hours after each application. Perimetric inflammation, or any latent pelvic disease, contra-indicates the internal use of electricity. [If by "internal" the author means intra-uterine, it may be that the inflammatory conditions alluded to forbid it; but the vaginal application of electricity, far from being contra-indicated by such states (provided there is no acute inflammation), is often of great service, being, indeed, according to our experience, the safest of all forms of local treatment, and the one that it is well to begin with whenever any doubt is felt as to whether the condition of the parts is such as to tolerate local treatment.]

12. Dr. Radford records a case of *laceration of the perinæum* extending through the sphincter ani, in which he secured good union by the immediate operation. [The article is headed "a case of complete rupture of the perinæum which united spontaneously," and the author seems to imply that the result has a bearing upon the question of whether lacerations of that character ever do unite spontaneously. Inasmuch, however, as two silver sutures were applied, we can not see that the union can correctly be said to have taken place spontaneously.]

17. Dr. Hime relates a case in which he performed *transfusion for anæmia due to menorrhagia.* The patient had been losing blood continually for four weeks, and was in a critical state of anæmia. After the transfusion was begun, "the patient soon remarked that she felt a warm glow throughout the body, which, however, quickly changed to a sensation of fullness in her throat and choking. All at once her breathing stopped, she became livid, her jaw fell, and a loud 'rattle' in her throat announced the speedy approach of death." A drachm of ether was injected subcutaneously, and artificial respiration was resorted to. She rallied, and ultimately did well. The menorrhagia, which had existed for five years, and was increasing in severity, ceased, and the patient regained her general health. The author wonders that transfusion is not oftener resorted to, regarding it as "much easier of performance than drawing a crooked-pronged molar tooth." He figures and describes an apparatus of his own device for maintaining the temperature and even flow of the blood. He exposes the vein, and passes two ligatures around it; one of them, below the opening, is tightened to prevent hæmorrhage from the distal part of the vein, and the other is tied around the vein, nozzle and all, to prevent loss of blood from the proximal part of the vessel.

18. Dr. Campbell relates a case in which *symptoms mistakenly imputed to subinvolution of the uterus* turned out to have been due to a small urinary calculus, and ceased at once when the latter was passed. [Subinvolution was present, however, and it is difficult to

see how the error could have been avoided.]

23. Dr. Wallace gives his experience with various *operations for prolapsus uteri*, consisting chiefly of a narrowing of the lower part of the vagina by means of longitudinal anterior (or anterior and posterior) elytrorrhaphy, more or less modified, according to the nature of the case, and associated with the operation for lacerated cervix, with fixation of the cervix to the anterior wall of the vagina, and with restoration of the perinæum. [His results have been very encouraging, although some of the cases reported offered little promise of success. Of the various procedures described, the one that seems most of a novelty is that of fixing the cervix to the anterior vaginal wall. Taking advantage of a large erosion of the anterior surface of the vaginal portion of the cervix, the latter was stitched to a raw area produced by dissecting up a flap of mucous membrane from the anterior wall of the vagina. It seems to us that this must give rise to a marked and permanent retroversion, and, in the absence of cystocele and with a sound perinæum, thus guard against procidentia by the mere fact that the uterus is unable to present at the vaginal outlet by its short diameter. Such a retroversion of the uterus is not likely of itself to give trouble in a patient past the menopause, and, as the author remarks of versions in general, may not even in younger subjects.]

24. M. Thorens employed *the actual cautery for anteversion of the uterus*, after the manner of M. Abeille, in the case of a patient who had anteversion along with increased size of the uterus, uterine catarrh, enlargement of the anterior lip of the cervix, erosions about the os externum, relaxation of the vaginal walls, and proctocele. The patient suffered a good deal with abdominal pain, and was unable to walk without a cane. She wore a hypogastric belt, and a Gariel's pessary had been tried, but proved insupportable. Cauterizations with nitrate of silver had also been resorted to, with cold douches and ablutions, and a tonic course of treatment—all without avail. Various incisions were made within the cervical canal by means of a heated hysterotome, and linear cauterizations of the anterior vaginal wall were practiced, together with more extensive cauterization of the swollen anterior lip of the cervix. The author explains his views of the mechanism of uterine deviations and of their cure, involving the idea [the correct one, we think] that traction upon the cervix through the medium of the vaginal wall is the best means for their correction. It was with a view to secure such traction, by cicatricial contraction of the anterior wall of the vagina, that that portion of the vagina was cauterized. The patient made a good recovery. [From the fact that anteversion was but one of several abnormalities, it may be doubted, as was hinted in the discussion that followed the reading of M. Thorens's paper, whether he did not really cure an engorged uterus in the attempt to correct an anteversion by such heroic measures.]

25. Dr. Banning relates four cases of *forcible correction of retroversion of the uterus.* In all of them the body of the organ was supposed to be fixed by adhesions. The result was successful in each instance. The method of replacement consisted in firm, steady pressure upon the body of the uterus by way of the rectum. He never delays the operation on account of inflammation, tenderness, or enlargement, "as all these are contingent to the locked condition of the uterus betwixt the sacrum and the pubes, and will readily disappear on restoring the uterus to a vertical position, and will never do this in its locked condition." The patient should be anæsthetized. No violent or fitful force must be used, but only a prolonged and steady one, the vagina being supported with one or two fingers. A flat elevator is the best means by which to exert the force. [By bearing in mind that the adhesions in these cases are described as "utero-rectal," the reader will avoid being led to look upon them as evidence of the safety of the practice of forcibly breaking up adhesions of the uterus to less movable parts.]

30. Dr. Mann's paper on *laceration of the cervix uteri* is largely clinical in its scope, giving details of seventeen cases in which the author has performed Emmet's operation within the past two years. He says that Dr. Emmet's discovery of the pathological importance of cervical laceration has always seemed to him to corroborate in a certain degree the views of Dr. J. H. Bennett, of London, who attributed a large part of uterine diseases to ulceration and inflammation of the cervical portion.

Had Bennett only gone a step further and shown the true cause of the inflammation and "ulceration" as we now know it, gynæcology would have been advanced twenty-five years at least. Dr. Mann states that he finds laceration of the cervix in about one third of all the women who apply to him with uterine disease, and alludes to such an amount of enlargement of the everted lips in some cases as to make them resemble fibrous tumors, for which, indeed, he thinks they have been mistaken by some English writers. The causes of laceration are very difficult to determine, and there must be a variety of them, one or more acting in each case. He can readily imagine that the forceps may sometimes produce the lesion if it is applied too early, before full dilatation has occurred, as is now so much the fashion. He has almost always found subinvolution of the whole uterus to be among the complications, and displacements have been "almost universal." In some cases the laceration, and in others the displacement, seemed to be the exciting cause of the symptoms. He has found prolapse of the ovaries in this connection only three or four times; in one case they seemed to resume their normal position after the operation. Pelvic inflammation has been a tolerably common complication. When severe, he has regarded it as contra-indicating the operation, and he has also refrained from operating in old cases in which the surfaces were all healed over without the formation of much new connective tissue in the substance of the cervix, as well as in cases of slight laceration in which there was no eversion, hypertrophy, or erosion of the flaps, or a high degree of subinvolution. In one case, in which both the cervix and the perinæum were torn, and in which there was extensive pelvic inflammation (cellulitis and peritonitis), he advised against any operation. The patient afterward went to the Woman's Hospital, in New York, where the operation was successfully performed, but without any benefit, the patient growing steadily worse after it. Operating in such cases can do no good, he remarks, and will but tend to throw the operation into disrepute. Serious diseases, not due to the uterine lesion, are among the contra-indications, but a bad general condition has not deterred him from operating when the laceration seemed to be the cause. He does not lay so much stress on the preparatory treatment as Dr. Emmet has done, being guided by the amount of congestion and denudation of the cervix, and by the extent and activity of the cellulitis present, for both of which conditions he is accustomed to advise long-continued hot vaginal injections and applications of iodine, iron, etc., which should be kept up until all tenderness is gone and the parts are pretty well healed over. As to the operation itself, the author has always followed Emmet's method, but intends to try catgut sutures, as used and recommended by Dr. Skene, especially when it is advisable to close both the cervix and the perinæum at one sitting. The benefit of the operation is not always seen at once; six months at least should elapse before we begin to despair. As regards the cure of menorrhagia, he has been somewhat disappointed, although in some cases it has been greatly lessened. The most that can be hoped for is that when the disease of the endometrium has been cured by appropriate treatment this operation may remove the tendency to its return. Instead of being resorted to unnecessarily, Emmet's operation is, he thinks, not done nearly as often as it should be, at least in his vicinity (Hartford, Conn.).

41. Dr. Ask gives a brief account of all his cases of *ovariotomy*, dividing them into two groups, according as antiseptic precautions were or were not employed. Of the seven cases in the latter category, two proved fatal; of the twenty-three making up the former class, only three ended in death. All of the fourteen patients operated on since 1880 have fully recovered. The author maintains that none of the major operations in surgery offer better chances of a successful issue than ovariotomy, provided it is carefully performed, and, above all, with a rigid observance of Lister's antiseptic method. In the two cases that proved fatal in his hands before he adopted the antiseptic method death was owing to septic peritonitis, probably caused by the escape of a portion of the purulent contents of the tumor into the abdominal cavity. Of the three deaths that followed the Listerian operation, one was due to profuse hæmorrhage during the operation, one to the patient's having stripped off the antiseptic dressing before the wound was perfectly healed; and one to a violent paroxysm of coughing, which opened the abdominal wound when it had almost united. All the operations were done in a large hospital, which, however, had never since its construction, in 1868, been the scene of any severe outbreak of surgical fever. Thanks to Listerism, there can now be no hesitation to perform ovariotomy in such hospitals. The operating-room should be heated to 86° Fahr., to prevent chilling of the viscera, and consequently of the blood. To disinfect the air of the room, it is sprayed, an hour before the operation, with a five-per-cent. solution of carbolic acid by means of two steam sprays. It is warmly urged that the abdominal incision should be of sufficient length, as this involves no increase of danger, according to the author, allows of more ease and rapidity in the operation, and gives a freer field of observation. In six of his cases the incision had to be prolonged above the umbilicus, and they all ended in recovery. Just as little does the author dread the escape of a portion of the contents of the tumor into the abdominal cavity, unless it consists of coagulated blood or of pus, and even then the danger is notably diminished by a rigorous observance of the antiseptic method and by scrupulously removing the fluid. For separating firm, cord-like adhesions between the tumor and the peritoneal surfaces the author employs Paquelin's cautery, and is thus enabled to dispense with ligatures. He also uses the same instrument to check hæmorrhage after breaking up adhesions in other ways. He always ties the pedicle with catgut and drops it. Subsequent hæmorrhage may be prevented by care in applying the ligatures. The fact that this method allows of complete closure of the abdominal wound, so as to guard against septic infection, makes it superior to any other method, especially the extra-peritoneal treatment with the clamp. For the sake of greater security he advises the application of Paquelin's cautery to the pedicle in addition to the ordinary antiseptic treatment. This proceeding may also exert a certain influence in preventing hæmorrhage from the pedicle at a menstrual period following the operation. Careful cleansing of the peritoneal cavity before closing the incision is of great importance if the character of the fluid that has escaped into it is such as to make infection probable. The author does not favor drainage of the abdominal cavity after closing the wound. In his opinion the utility of this procedure is more than counterbalanced by the danger of septic invasion by way of the drainage wound, and usually after the abdominal incision is closed any effusion is absorbed as fast as it is poured out. In closing the wound, silkworm-gut is used for the deep sutures and silver wire for the superficial ones. During the insertion of the former the intestinal coils are protected with a sponge soaked in a warm solution of carbolic acid and then well squeezed. The sutures should be placed very close together, and should traverse all the structures of the abdominal wall, including the peritonæum, at a distance of about a centimetre from the wound. The superficial sutures also should be inserted close together, so as to secure perfect coaptation of the cutaneous edges of the wound. Over these the ordinary Lister dressing is applied. Generally it is not necessary to apply this more than twice in succession. The first one is removed at the end of four or five days, when, as a rule, the deep sutures are removed. The second dressing is kept on until the tenth or eleventh day; the superficial sutures may then be removed, and in the great majority of cases the wound will be found quite healed, so that the Lister dressing is no longer necessary. The author has never met with any serious inconvenience from the use of carbolic acid.

QUARTERLY REPORT ON OPHTHALMOLOGY AND OTOLOGY.

No. VII.

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5. Sigismund brings his paper upon *myopia and hypermetropia* to an end with the following conclusions: 1. It seems proven that emmetropes and hypermetropes of low degrees may acquire a low degree of myopia by continuous convergence of the eyes. When a high degree of myopia appears in early youth, or when progressive myopia appears in persons who have but little occasion to maintain a high degree of convergence, we must assume the existence of a congenital disposition to the development of myopia. 2. The decussation of the optic nerves upon the sella turcica indicates that Nature has thus endeavored to prevent a drawing out of the optic nerve from the cranial cavity. 3. A stretching of the optic nerves occurs in convergence of the anterior segments of the eyes toward the median line, because the posterior segments make an equal movement toward the temporal side. The optic nerve must thus undergo stretching at its point of attachment to the eyeball, which under certain conditions may produce staphyloma posticum and myopia. 4. A stationary, unchanged myopia is not a misfortune for the individual who has acquired it; nor is it a national misfortune when a certain percentage of the children attending school annually become myopic. A change from hypermetropia to myopia is at least no misfortune. 5. Nevertheless, all possible means must be employed to avoid a condition of constant convergence upon objects that are too small, too near, and too badly illuminated; not only because of the danger of the production and increase of myopia, but also in the interest of the hypermetropes, who are constantly exposed to asthenopic troubles and convergent squint.

7. The investigation into *the condition of the eyes of the public-school children of Philadelphia*, carried on by Dr. Risley and his associates, has been thorough, and extends over a considerable period. Among the questions for elucidation were the following: 1. Would our more youthful civilization yield different results regarding the percentage of increase in myopia from those reached by European observers? 2. Myopia having been found to increase during school life, did the increase come from the emmetropic eyes while they were recruited *pari passu* from the hypermetropic? i. e., did the eyes with hypermetropic refraction pass through emmetropia to swell the percentage of myopia? 3. What relation, if any, existed between our educational process and the increasing percentage of near-sight, and to what extent were imperfections in our school system responsible for the increase? Risley summarizes the whole subject in the following conclusions: 1. The emmetropic eye is the model or standard eye. 2. Myopia, commencing in the primary classes with a low percentage, steadily increases as the pupils pass to the highest grade in our public-school system; the percentage of increase is very much lower in the schools of Philadelphia than in the schools of Europe; the myopic eye presents a higher percentage of disease than eyes with emmetropic or hypermetropic refraction; and the percentage of disease is much higher when astigmatism is also present. 3. Hypermetropic eyes are more numerous than both myopic and emmetropic combined; next to myopic astigmatism, distinct lesions are most prevalent in eyes with hypermetropic astigmatism; the increase in myopia is from eyes with already existing anomalies of refraction. 4. While there is an evident and close relation between the increase of myopia and school life, nevertheless the educational methods are responsible to only a limited degree. Given an emmetropic or normal eye, the probabilities are that no harm will come to it from the educational process. On the other hand, given an eye with an anomaly of refraction, especially astigmatism, the probabilities are, other things being equal, that the educational process will be fraught with pain and danger to the eye. 5. The probability of harm resulting from school life diminishes with every added year of age in all states of refraction. Our children are placed at school at too tender an age. 6. In view of these facts, the great importance of proper hygienic surroundings, and a wisely-chosen and arranged curriculum of study, is more than ever manifest.

17. Cohn considers the practical side of *color-blindness* by discussing the different methods of detecting it. He finds that all the means hitherto suggested are not sufficiently exact. He regards the latest edition of Stilling's colored plates as the quickest, simplest, and most trustworthy. Plate 2 he regards as the finest and most complete snare for the color-blind that has ever been contrived, and thinks that whoever can not read the letters upon it has no normal color-sense.

31. Hilbert reports a case of *intermittent acute catarrhal conjunctivitis* in a man, aged 31, who lived in a malarial locality. The conjunctivitis was of the tertian type, and on the intervening days had entirely disappeared. After its fourth appearance, Hilbert gave the man one dose of 16 grains of quinine, and the next day two doses of 8 grains each. On the third day there was no conjunctivitis, and there was no recurrence afterward. The patient had an enlarged spleen.

39. Fuchs recommends in *the treatment of gonorrhœal conjunctivitis* Cooper's method of splitting the lid, with modifications. He first splits the external commissure with the scissors, and then deepens it with the knife until the lids are entirely relaxed. He then everts the lower lid by a long, deep suture in the cheek. Five days later the latter is removed. In most of the cases in which he has tried this method the cornea remained clear, or when cloudy it soon cleared up.

41. Despagnet describes in detail *Galezowski's operation for pterygium by turning in*, and advocates it strongly. As soon as the pterygium has involved the cornea the operation is indicated. The apex of the growth is seized with the forceps, separated very carefully from its corneal adhesions, and then carefully dissected up to its base. When the pterygium is free throughout its entire length, he takes a thread, armed at each end with a curved needle, and pierces the apex with both needles so as to include it in a small loop. Then, turning the needles inward, he brings them out at the base of the tumor, one near the upper, and the other near the lower, margin. The two ends are then tied in a tight knot, and thus the apex of the pterygium is turned inward toward the base, and the latter is strangulated by the knot. The pterygium, abandoned to itself, atrophies, and the ligature is left to ulcerate its way out. Lotions of a phenic-acid solution are employed several times a day for the purpose of destroying any microbia that may be present.

43. In two cases Pedraglia has tried *massage in episcleritis*, with excellent results. Both cases were pure episcleritis, without pustules or corneal complications, and of non-specific origin. The first occurred in a man aged 20; massage was employed four times, once every two days, and the sclera had become so pale that on the sixth visit he was discharged cured. The second case was also in a man aged 21, and here only three applications of massage were found necessary to remove almost all the inflammation. No other treatment was employed.

44. Von Reuss comes to the following conclusions as to *the influence of age upon the curvature of the cornea*: 1. In children, during the first weeks of life, the corneal curvature is much more marked, and the radius of curvature much shorter, than in the normal eyes of adults. 2. The greatest change, however, occurs during the first six months of life. 3. From that period up to the seventh year the corneal radius increases gradually. 4. From the seventh to the twelfth year the cornea apparently undergoes no change of curvature. 5. In the thirteenth and fourteenth years the corneal radius again increases. 6. Between the fifteenth and twentieth years the corneal radius reaches the length which it maintains in adults under normal conditions.

46. Galezowski describes *calcareous degeneration of the corneal epithelium* as developing very slowly, and states that the patient does not completely recover his vision until five, six, and even eight years have elapsed. It is generally idiopathic, and presents no complications in other parts of the eye. He has removed several of these opaque epithelial pellicles, and on examination found them filled with granulations pressed closely together so as to hide the outline of the cells. They were hard, and resisted compression; they were spherical, yellowish, and highly refracting. They were insoluble in ether or chloroform, but were dissolved in hydrochloric acid. The deep layer of epithelium is almost always unaltered. Galezowski regards the disease as a calcareous keratitis, the result of a particular diathetic influence. When this opaque epithelium has once been removed there is no reproduction of it. He employs dilute hydrochloric acid in the treatment of the affection, making applications to the opaque spots.

47. Del Toro describes a method which he has employed for some time for *the cure of conical cornea.* He first does an iridectomy, and waits twelve or fifteen days for the wound to heal. Then with a very fine knife heated to a white heat he destroys the vertex of the conical cornea, which can be done immediately and with scarcely any pain. He then applies a compressive bandage for two weeks, and at the end of that period a cure is obtained, leaving a slight opacity. This cauterization also seems to exercise a beneficial influence on the existing keratomalacia, while the early iridectomy, he claims, diminishes the intra-ocular tension. The only precaution necessary is to carefully avoid opening into the anterior chamber with the hot knife.

49. Fuchs recommends the use of *the actual cautery in ophthalmic therapeutics.* Its application is not very painful, and the subsequent reaction is very slight. He thinks that the cautery should be heated to a faint red heat. He advises its use in corneal abscesses, or hypopyum-keratitis, and ulcus corneæ serpens, in the ulcus rodens of the cornea, and in all torpid or rapidly destructive ulcers of the cornea. Of course the point cauterized remains permanently opaque. Fuchs has used it in cases of spontaneous and of traumatic origin, and also in cases of superficial corneal neoplasms.

51. In bad cases of *interstitial keratitis with congestion or inflammation of the iris*, Galezowski considers it necessary to detach the pupillary margin of the iris from its adhesions, so as to check the anomalous state of the lymphatic circulation of the eye. He considers iridectomy as the most efficacious and certain means to this end in every case where the disease pursues an irregular, abnormal course. with complications in the iris or sclerotic. The operation should be done as soon as possible whenever no amelioration is produced by the ordinary methods of treatment.

52. In a short paper upon *neuroparalytic keratitis*, Haase thinks it is evident that the Gasserian ganglion is not the seat of the center of nutrition for certain definite nerve-fibers, but that this center is situated at the origin of the nerves; and that disturbances of innervation in the eye occur also from pathological changes above the ganglion of Gasser, the nervous structure of the ganglion itself being found unaltered. In one case, which he cites in detail, the autopsy revealed a large focus of disease in the pons, entirely destroying the large root of the trigeminus, and causing a degeneration of a portion of the nerve-fibers in the first branch for a long distance toward the periphery, while all the fibers of the second and third branches, and most of those of the root, were intact, as was also the ganglion of Gasser. This result proves his assertion as to the situation of the center of nutrition.

65. Abadie considers *the comparative value of iridectomy and sclerotomy in glaucoma.* In acute glaucoma he regards the former as indispensable, and thinks it also gives good results in intermittent glaucoma and in glaucoma accompanied by inflammatory complications. But in certain forms of malignant glaucoma iridectomy is by no means always to be relied upon. In hæmorrhagic glaucoma a favorable result is but rarely gained from iridectomy; while the enlargement of the pupil by the coloboma and the astigmatism which results from the cicatrization of the corneo-scleral wound, even in the most favorable cases, cause a sensible diminution of the visual acuity. On the other hand, he reports cases in which, in spite of the sclerotomy, the glaucoma has continued to progress, although he has never met with any accident resulting from the operation itself, as is often observed after iridectomy. He thinks sclerotomy indicated: 1. In hæmorrhagic glaucoma; 2. In simple chronic glaucoma; 3. In forms of congenital hydrophthalmus with increase of tension, where, owing to deformity of the ciliary region, the excision of the iris might be followed by rupture of the zonule, luxation of the lens, or prolapse of the vitreous; 4. In those rare forms of progressive glaucoma which seem to progress in spite of iridectomy.

66. Jany has become convinced by later observations of his own upon *sclerotomy in glaucoma* that it is not applicable for certain varieties, and not to be depended upon as a means of cure. Certain forms of violent acute glaucoma are no more affected by a sclerotomy than by a simple paracentesis. He thinks the question of the proper place for sclerotomy to be still undetermined.

67. In citing a case of *glaucoma preceded by optic neuritis*, Fox and Brailey's opinion as to its causation is that a neuritis caused an acute inflammation of the walls of the central vessels with a resulting thrombosis of the vein. The inflammation then extended forward, especially along the loose episcleral tissue and its blood-vessels, where it found increased expression in the walls of its numerous veins. Passing inward along the anterior ciliary vein, it set up acute inflammation in the fibers of the ciliary muscle. The enlargement of the arteries of the ciliary body may also have been due to the venous thrombosis.

68. Brailey holds that in *glaucoma* inflammation of the ciliary body, iris, and optic nerve is always present, and that it is one of the earliest symptoms of primary glaucoma, being developed previous to the tension. It is usually most pronounced in the ciliary body, especially in and around its muscular fibers. The advanced position of the iris is caused in the first instance by an enlargement of the ciliary folds, due to their vascular turgescence, but afterward its application is rendered more close and extensive by the pressure of fluid behind it. Afterward there arises very rapid atrophy of the ciliary muscular fibers, with, very commonly, dense connective-tissue formation between them and in the optic nerve. The choroid is compressed and atrophic, but rarely presents any trace of inflammation. The cause of the increased intraocular fluid is in the first instance an inflammatory hypersecretion of fluid from the ciliary body and iris. But when the iris has once become applied to the cornea, another cause is established in an obstructed outflow of fluid from the globe through Schlemm's canal. When atrophic changes have supervened in the ciliary body and iris, this occlusion of the entrance to Schlemm's canal remains as the sole agent in keeping up the tension. Iridectomy cures by removing the periphery of the iris, and is effective. provided the inflammation is not in an acute stage. But in glaucoma of long standing the atrophied iris is so firmly adherent to the cornea that its removal by iridectomy can not be effected. In such cases sclerotomy may cure by making a new access to Schlemm's canal.

72. Vidor's paper on *congenital cataract with a hard nucleus* is a plea for the operation of discission in these cases. He thinks that in the apparently soft cataract occurring in children, with a hard nucleus, it is better surgery to first do a needling, and afterward to perform linear extraction only when signs of irritation appear, or when the discission has produced no result.

73. Streatfeild's paper on *fictitious cataracts* is made the basis of some remarks upon the importance of drawing a line of separation between cataract and other opacities of the lens. He would not include as cataracts any of those cases in which the light of the ophthalmoscopic mirror shows in the pupillary space, in the place of the lens, no opacity or striæ. If the lens opacity is perfectly penetrable by the light of the ophthalmoscopic mirror, he would call the case one of lens-opacity, and not cataract. Such opacities do not necessarily imply incipient cataract, and should not be confounded with it. Besides those common senile changes in the lens, where there is a gray or amber tint diffused through the lens, which is not and never will be cataractous, there are other deceptive appearances often mistaken for cataract, and the surgeon should be on his guard against all such half-diagnoses.

86. The authors' paper upon *the relation of the retinal changes to the other pathological conditions of Bright's disease* recognizes the hypertrophic condition of the walls of the arteries throughout the body. In addition to this, in the well-known opaque white patches in the retina there is a thickening of the intima, leading to occlusion of the majority of the arteries of the part. This condition is accompanied by degeneration and inflammatory changes, the nerve-cells, nerve-fibers, and fibers of Müller being affected. The authors believe this affection of the arteries to be an exaggeration of the end arteries often observed in the larger trunks of the body generally, where it gives rise to atheromatous patches; and that it precedes and gives rise to the other inflammatory and degenerative changes encountered in the kidney and retina.

88. Hirschberg describes *a black optic nerve* which he saw in a patient, aged 9½, who had marked convergent squint, with a microphthalmic cornea and brown iris on the same side, the other iris being blue. The entire optic disk was a dark grayish-black, with a slight atrophic excavation of a dark-gray color. The disk was surrounded by a broad, brilliant-white, sharply-defined patch of choroidal atrophy, resembling an annular posterior staphyloma. In the vicinity of this zone were some patches of black and white color. This condition of the optic disk was probably congenital.

89. Leber and Deutschmann have published their observations upon ten cases of *fracture of the skull with optic-nerve complications.* Besides the amblyopia occurring in all the cases, there was vomiting in two cases, bleeding from the nose, mouth, and ears in four cases, hæmorrhage into the orbital tissue and under the conjunctiva and skin of the lids in seven cases, hemiplegia in one case, paralysis of the ocular muscles in two cases, deafness in one case, and loss of the sense of smell in one case. In nine cases the immediate result of the injury was unilateral complete blindness or a high degree of amblyopia, and the ophthalmoscope showed a condition of hyperæmia of the disk which ended in pronounced white atrophy. The cause of the total blindness the authors consider to be a crushing or laceration of the optic nerve in the optic foramen, and their observations indicated that this descending atrophy required about three weeks to extend from the optic foramen to the optic disk. They consider that the dangerous character of fractures at the base of the skull has been overestimated.

91. In *the use of electricity for atrophy of the optic nerve and retina*, Gunn uses Weiss's continuous-current battery, the positive pole being applied lightly over the closed lids of one eye, and the negative pole to the opposite eye or temple. The power is gradually increased until a distinct sensation of a flash of light is experienced by the patient on making or breaking the circuit. The anode is then kept over the eyelids, while the cathode is applied in turn to the top of the spine, to a point just behind the mastoid process, and to the supra-orbital region of the same side, the latter being the point generally chosen. Of eighteen patients with optic-nerve atrophy, six distinctly improved under treatment, four others received doubtful benefit, and eight did not improve at all, or grew worse. The younger the patient the greater is the probability of success, other things being equal. The more recent the amaurosis the more likely is it to be benefited by treatment. The greater the amount of vision retained the better hope of benefit; but the successful and unsuccessful cases overlap each other. In the unsuccessful cases color-perception was retained better than in the others. There seemed to be a definite connection between the size of the large vessels and the probability of improvement under treatment, the prognosis being bad where the size was diminished. All the patients with retinal atrophy with pigment were improved by this treatment. Gunn believes that galvanism will be found serviceable in retinitis pigmentosa, and partly from a consideration of the nature of the failure of vision in these cases. The pigment deposited in the layers of the retina absorbs the rays of light which would otherwise penetrate and stimulate certain of the rods and cones. The nerve-fibers in connection with these retinal end elements are now thrown absolutely out of employment. Corresponding with the distribution over the fundus,

in recent cases we find an annular scotoma; but soon the more peripheral field also fails, the part within the blind ring contracts more and more, and finally central vision itself deteriorates. Night-blindness becomes a more prominent symptom, since much of the light is lost by absorption in the pathological pigment; the deficient blood supply interferes with rapid tissue change, and a degenerated nerve conveys with difficulty stimuli which in themselves are abnormally feeble. The mere fact of the nerve being no longer acted on by normal stimuli assists in the atrophic process, and this secondary atrophy from disease he believes electricity will prevent.

91. Secondi reports an interesting case of *pulsating exophthalmus*, bilateral in character. The patient was a man, aged 28, who had fallen, striking his forehead a violent blow, and become unconscious. Consciousness was not regained for several hours, and he bled from the mouth, nose, and ears. There was ecchymosis of the conjunctiva and eyelids, and he suffered from severe pain in the head continuously for fifteen days. Secondi diagnosticated a fracture of the base of the skull, with subsequent development of an arteriovenous aneurism, or possibly of an aneurismal varix. He assumed that a rupture of the left internal carotid artery in the corresponding venous sinus was caused by the fracture.

103. Quioc's paper upon *the conjugate deviation of the eyes in bulbar lesions of the encephalon* is very long and difficult to abstract, but from his carefully-studied observations he draws the following conclusions: I. As regards the conjugate deviation of the eyes: 1. The abducens nerve furnishes an anastomosis, formed of the peripheral fibers, which passes obliquely across the medulla oblongata from the nucleus of the sixth nerve to the trunk of the third nerve on the opposite side. 2. Every lesion involving either the nucleus or the trunk of the sixth nerve and the anastomotic branch which passes to the third nerve of the opposite side causes a conjugate deviation of the eyes. 3. The conjugate deviation of the eyes in paralysis of the external rectus and conjugate inaction of the opposite internal rectus, and occurring on the side of the paralyzed muscles, is due to a lesion in the posterior part of the bulbar region, in a territory comprising the nucleus of the sixth nerve and a peripheral zone. 4. There may also occur a conjugate deviation of the eyes on the opposite side from the lesion, when the latter is situated in the cerebellum or in that portion of the fasciculi of the cerebral peduncle which extends between the tubercula quadrigemina and the nucleus of the abducens. 5. The conjugate deviation of the eyes occurs on the same side as the lesion when the latter is located in the hemispheres, the peduncle of Meynert, or the protuberance, provided in the latter case the region of the bulbar protuberance is not involved. II. As regards the rotation of the face: 1. In anatomy, the rotatory centers, especially of the spinal nerves, are connected with the longitudinal fibers of the cerebral peduncle, which unite them to the tubercula quadrigemina of the opposite side. 2. In physiology, the tubercula quadrigemina exercise a reflex influence upon the rotation of the face. 3. In pathology, division of the fibers of communication causes a rotation of the face to the opposite side by tonic predominance of the antagonistic center. But the will exerts its influence upon the two antagonistic groups, so that the rotation of the face immediately disappears under its influence.

104. Deutschmann's paper is an experimental study of *miliary tuberculosis of the brain and its membranes, and its connection with diseases of the eye.* He used rabbits about four weeks old in his experiments, and injected tuberculous material with a Pravaz's syringe through the soft skull-walls into the brain. He usually injected into the right frontal cerebral lobe, and usually only a few drops of pus. Three weeks after the injection the first ophthalmoscopic changes may be noticed, simultaneously in both eyes, though not exactly in the same degree. They consist of an engorgement of the retinal vessels, especially of the veins, and injection of the disk. The latter gradually increases, and the borders of the papilla become swollen and elevated. This condition lasts a few days and then gradually subsides, or else the papillary swelling increases more rapidly, especially at the edges. The character of the central excavation almost entirely disappears. In short, the entire picture resembles that of papillitis, or choked disk. On making an autopsy on these animals the same changes were found in the optic nerves as in the brain membranes, only the tubercles of the sheaths had undergone caseous degeneration. The sheaths were very loose, and the intervaginal space was markedly distended. About four mm. back from the point of entrance of the optic nerve no anomaly of the nerve could be found. The papilla proved to be atrophic through a part of its extent, and the microscope showed marked hypertrophy of the connective-tissue framework. There were no tuberculous changes in the papillæ. In the vitreous the glistening white spots proved to be miliary tubercles. There were also membranes in the vitreous—some large, some fine, consisting of a finely-folded, hyaline substance with round cells. The retina in some of the cases was entirely unchanged, but the choroid was filled with tubercles. Deutschmann thinks that the constant appearance of the first tuberculous change of the optic-nerve sheath at the foramen scleræ proves that the infecting substance, following physical laws in its extension, flows with a certain rapidity downward into the optic-nerve sheath, and is mechanically stopped at the entrance of the optic nerve into the eye. Hence there is no time for any descending perineuritis or neuritis to develop. The serous fluid found in the intervaginal space comes from the arachnoidal space, and is hydrocephalic. It was found mainly at the entrance of the optic nerve, and caused the primary signs of papillitis. Another possible explanation of the tuberculous infection of the optic-nerve sheath is that portions of the infectious material injected into the arachnoidal space passed directly into the intervaginal space, and thus gave rise simultaneously to both cerebral and vaginal tuberculosis. But this assumption is improbable for the following reasons: the pus or tuberculous matter is extremely tenacious and only slightly movable, and the very small quantity of cerebro-spinal fluid certainly could not carry it down. Moreover, another fact that weighs against the assumption of such a direct infection of the optic-nerve sheath by the inoculation mass is that, when we find, about five weeks after the injection, very fresh tubercles in the optic-nerve sheath, the cerebral process has already extended much further, even to complete caseous degeneration.

108. Féré's article on *ophthalmic migraine* is interesting. He regards the affection as characterized by various ocular troubles, consisting either of subjective sensations of a luminous colored spectrum, or of an obliteration of a part of the visual field, and preceding the headache, which appears generally in a limited space on the temple, whence it spreads to that half of the skull corresponding to the side on which the ocular troubles have manifested themselves. In the great majority of cases the visual troubles open the scene; it is exceptional when they are preceded by headache. Sometimes the first symptom is a transient hemiopia, which is rather a lateral narrowing of the visual field than a true hemiopia, and is always homonymous. Another symptom which may accompany the other visual troubles, or exist alone, is the scintillating scotoma. The visual troubles are often accompanied by neuralgic attacks or by a sense of tension in the affected eye. Amblyopia with crossed neuralgia is exceptional. The ocular or orbital pain may be accompanied by lachrymation and photophobia. In complicated cases we sometimes meet with impairment of speech, or with sensory or motor troubles in the face and extremities. Aphasia is the most frequent of these complications. Sensory disturbances appear as formication or numbness of the hand or arm, sometimes extending to the entire side of the body. Motor disturbances are rarer than the sensory; they consist in paretic attacks or in complete paralyses, usually occurring in the arm only, though they may involve the face, and even the entire side of the body. Sometimes the migraine coincides with epileptiform attacks, but these attacks must not be confounded with certain visual hallucinations which precede the epileptic attack. Attacks of migraine are generally transient and of short duration. The associated troubles show that the ocular symptoms can not be attributed to a morbid local phenomenon like spasm of the retinal arteries. It must be a cerebral phenomenon, probably an anæmia, and Du Bois Reymond's hypothesis of irritation of the sympathetic may therefore be admitted, which induces spasmodic contractions of the cerebral vessels and a momentary and limited anæmia.

109. Gauté concludes his discussion of *the influence of gout upon diseases of the eye*. He considers that the cornea may be the seat of a gouty inflammation, which is usually consecutive to a scleritis. Another form is a posterior keratitis punctata situated in the inferior portion of the cornea, in the shape of a triangle with the apex upward. There is no pain or photophobia accompanying either form of keratitis. The absence of pain he regards as one of the principal functional symptoms. In the iritis due to gout, circumorbital pain is manifested from the beginning, is very violent, and lasts from eight to ten days, and it is sometimes accompanied by a slight œdema of the eyelids. Synechiæ form very rapidly. Sometimes the disease begins slowly and insidiously, sometimes suddenly and with violent pain, lachrymation, and cloudy vision. Occasionally glaucomatous phenomena appear, which may end in rupture of the sclera or cornea. Sometimes sympathetic ophthalmia takes place in the fellow-eye, and more rarely atrophy of the affected eyeball. Detachment of the retina results sometimes from liquefaction of the vitreous, exudation between the retina and the choroid, and separation of the two. Gauté agrees with Hutchinson and Galezowski in describing a form of cataract due to gout. These cataracts are of thin consistence, semi-soft, and are accompanied by iritis or irido-choroiditis. He reports four cases of special exudation into the retina, all in gouty patients. The accompanying retinitis is of slow progress, and is not affected by treatment. His treatment of all these cases of gouty complications in the eye does not differ from the ordinary methods pursued in this class of cases. He speaks highly of both jaborandi and pilocarpine, and also of the alkaline mineral waters of Vichy, Vals, Kissingen, and Kreuznach.

112. In speaking of *sympathetic ophthalmia*, Critchett believes that the nature of the injury exerts a very powerful influence upon the initiation of the disease, and that a peculiar and exceptional condition of the nervous system is a powerful agent in these cases. As to the period occupied in the development of the disease, it is usually found that it has run its active course, and completed its morbid changes, in from twelve to eighteen months. Although in every instance there is a complete transformation of the iris, lens, and capsule into a tough, opaque, and inelastic tissue, yet, as a rule, the fundus of the eye is but slightly involved. Any operative interference during the progress of the disease Critchett justly regards as contra-indicated, as being almost sure to be followed by aggravation of the symptoms. He emphasizes the fact that, disease once sympathetically established, even in a slight degree, enucleation of the injured eye entirely fails to arrest the trouble, and that cases occur not infrequently where some useful sight has ultimately been retained in the wounded eye, when that which was secondarily involved has become absolutely blind.

113. Leber considers the subject of *an infectious origin of sympathetic ophthalmia.* He thinks that if such an assumption be correct, the ciliary-nerves theory must be given up, and that Mackenzie's old view—that the optic nerve is the channel of conduction for the inflammatory process—must be taken up again. In four eyes enucleated for sympathetic trouble he found pronounced hyperplasia of the intervaginal connective tissue of the optic nerve, with proliferation of the endothelium. He refers to the fact that acute panophthalmitis is not usually productive of sympathetic inflammation, because the inflammatory seeds are partly got rid of by purulent perforation of the eyeball, and partly destroyed or rendered inert by the enormous development of pus. He asserts that in his own experience the outbreak of a sympathetic inflammation is not preceded by any marked irritability of the ciliary nerves; and sensitiveness of the ciliary region he does not regard as a sufficient proof of this irritability. One difficulty in the way of accepting this propagation theory is that the first manifestation of the inflammatory process in the second eye appears always in the uveal tract, whereas we should expect an inflammation of the optic papilla. Now, Leber thinks that the latter may always be present without being distinctly seen, owing to the sinister character of the inflammatory process and the turbidity of the vitreous humor. He thinks it both possible and probable that sympathetic iritis is an inflammation that has extended from the optic-nerve sheath to the eye, and Knies has indeed gone far toward assuming such a theory of sympathetic inflammation.

114. Mooren's paper on *the pathogenesis of sympathetic disturbances of vision* is a strong plea for the possibility, and in many cases the probability, that the optic nerve is the seat of the lesion, and that the disease is propagated to the fellow-eye along the course of the optic-nerve fibers.

118. Von Wecker reports some experiments in *stretching the optic nerve*, and gives directions as to the method of performing the operation. He operated only upon blind eyes, and undertook the experiments solely to determine what influence it would have upon the nerve centers, and whether hallucinations, pain, etc., were diminished by it. He divides the conjunctiva on the internal side of the cornea, and then the internal-rectus tendon, as in the operation for optico-ciliary neurotomy. Then, turning the eye outward, he passes a strabismus hook through the wound and pulls the optic nerve forward quite forcibly. He then withdraws the hook, reattaches the divided tendon of the internal rectus muscle to the sclera, and dresses the wound antiseptically. He considers that the optic nerve can be stretched without any danger of irritating the membranes of the brain.

120. In the course of a series of *experiments with homatropine and atropia upon the human eye*, Oliver has come to the following conclusions: 1. A single instillation of either $\frac{1}{40}$ or $\frac{1}{20}$ grain of hydrobromate of homatropine is insufficient to paralyze accommodation, and hence is of no value in estimating refractive error. 2. Complete paralysis of the ciliary muscle can be obtained by a single instillation of either $\frac{1}{40}$ or $\frac{1}{20}$ grain of sulphate of atropia. 3. A single instillation of $\frac{1}{20}$ grain of hydrobromate of homatropine is capable of producing full dilatation of the pupil; while it is impossible to produce maximum dilatation by a single instillation of $\frac{1}{40}$ grain of the same drug. 4. Maximum dilatation of the pupil is produced by a single instillation of either $\frac{1}{40}$ or $\frac{1}{20}$ grain of sulphate of atropia. 5. The utmost action of a single instillation of $\frac{1}{40}$ grain of hydrobromate of homatropine upon the ciliary muscle is attained later and lost sooner than the full paralysis occasioned by a single instillation of an equivalent amount of sulphate of atropia. 6. The utmost action of a single instillation of $\frac{1}{20}$ grain of hydrobromate of homatropine upon the ciliary muscle is attained sooner and more quickly lost than the full paralysis occasioned by a single instillation of an equivalent amount of sulphate of atropia. 7. The mydriasis from a single instillation of either $\frac{1}{40}$ or $\frac{1}{20}$ grain of hydrobromate of homatropine is not so quickly produced, and is of shorter duration, than that from a single instillation of either $\frac{1}{40}$ or $\frac{1}{20}$ grain of sulphate of atropia. 8. Complete ciliary paralysis can be obtained by a single instillation of $\frac{1}{60}$ grain of hydrobromate of homatropine at the time of the utmost action of a single instillation of $\frac{1}{20}$ grain of hydrobromate of homatropine, thus allowing ametropia to be accurately determined. 9. A single instillation of either $\frac{1}{40}$ or $\frac{1}{20}$ grain of hydrobromate of homatropine, by reason of its transient effect on the iris and ciliary muscle, is valuable when we desire accurate ophthalmoscopic examinations. 10. The conjunctival irritation from hydrobromate of homatropine may be avoided by the use of an absolutely neutral salt.

121. From a number of observations upon *the physiological effects of the hydrochlorate of homatropine upon the eye* Galezowski draws the following conclusions: 1. Homatropine has a very powerful dilating action upon the pupil, which, however, does not last more than eighteen or twenty hours. 2. It paralyzes the accommodation but very slightly, and the paralytic effect does not last more than two or three hours. 3. It possesses no local irritating properties, and may be employed with advantage in cases in which atropine and duboisine produce an exanthem. It is useful for making ophthalmoscopic examinations, inasmuch as it causes scarcely any inconvenience to the patient. It may be used in cases of serous iritis where there might be danger of exciting glaucoma by the instillation of atropine.

125. Galezowski speaks highly of the *oil of cade as an antiseptic application in suppurative diseases of the conjunctiva and cornea, and after operations.* As soon as a conjunctivitis begins to appear purulent, he suspends all cauterizations, and introduces beneath the lids three or four times a day an ointment made of oil of cade, 2 grammes; vaseline, 10 grammes. As a result, the swelling of the lids rapidly disappears, suppuration diminishes, and the eye is saved. The sooner the treatment is begun the more rapid is the cure, and it should be continued until the conjunctivitis has again become catarrhal.

The oil of cade destroys the microbia present in the discharge, without cauterizing the surface of the conjunctiva.

126. Just has tried strict *antisepsis in all operations on the eye*, his method being as follows: The evening before the operation the patient's hands and face are washed with soap and then bathed with a solution of carbolic acid, and the latter is repeated in the morning. The instruments are placed in a five-per-cent. solution of carbolic acid and dried just before the operation. Throughout the entire operation a spray of carbolic acid is kept up until the bandage is applied. The latter consists of moist borated lint, borated cotton, and a borated bandage. The bandage is changed on the following day, with disinfected hands, under the spray. In spite of all these precautions, in twenty-five cases suppuration in the wound appeared in two cases within the first twenty-four hours. Among 200 cases of extraction done without any antiseptic agency there was not a single case of corneal suppuration, while among 207 of extraction, under more or less strictly antiseptic rules, there occurred nine cases of corneal suppuration.

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4. Gruber discusses *the significance of the habit of some deaf patients of keeping the mouth open.* 1. He thinks it highly probable that certain deaf people who are annoyed by loud respiratory noises produced in the nose hear better by opening the mouth; but that it can not be asserted that these respiratory noises are the sole reason why deaf persons keep the mouth open in listening. 2. The perceptible improvement in hearing gained by keeping the mouth open is in many patients due to the changes in the external auditory canal and deeper structures of the sound-conducting apparatus produced by sinking of the lower jaw. 3. In many of these patients the hearing power is improved by the change in resonance produced by the condition of the mouth. 4. The facilitation of the respiratory act which is produced by the opening of the mouth would probably aid in improving the hearing power.

5. Blake reports two cases of *idiopathic othæmatoma treated successfully by pressure and massage* in a short space of time. The tissues were gently but firmly rolled between the thumb and finger, with gradually-increasing force for ten minutes, and then the pressure was gradually diminished for five minutes. There was no pain caused by the massage, but it was accompanied and followed by an intense hyperæmia of the auricle, which, however, subsided within an hour or two.

7. Spear suggests a simple procedure for assisting *the removal of foreign bodies from the ear.* When the foreign body is found in the cartilaginous portion of the canal, and the fingers of the surgeon are pressed firmly upon the skin close to and in front of the tragus, and ear-

ried upward and around the meatus upon the auricle and back again to their starting point, then lifted up and the manœuvre repeated several times, the foreign body will be seen to move outward, and will finally drop into the depression at the bottom of the concha. When the foreign body lies beyond the center of the cartilaginous portion of the canal, and has even been pressed partly into the osseous portion, the same movements of the canal will bring it nearer the entrance of the meatus, or will, perhaps, change its position, so that other means, such as syringing, will more easily remove it.

11. Green's paper on *desquamative inflammation of the ear* discusses three varieties: 1, collections in the canal without any affection of the deeper parts; 2, collections in the canal associated with purulent inflammation of the tympanum and perforation of the drum membrane; 3, collections in the cavities of the middle ear associated with purulent inflammation of the tympanum. The microscopic character of the collections is the same in all, and in all the cases they were associated with inflammation of the surfaces to which they were attached. From the constituents of these collections, and their association with inflammation, it would readily occur to any one that we were dealing with a retention of the products of inflammation; but, the collections once formed, they become the prominent and difficult feature in the case. The cavities of the external and middle ear are particularly predisposed to large epidermal collections, which produce symptoms in themselves, and which by their growth may cause atrophy, caries, or inflammation of contiguous parts.

13. Baginsky's experiments upon *the function of the semicircular canals and the consequences of increased pressure in the tympanum* are very interesting. He found: 1. That various fluids injected into the drum of rabbits produced in every case a definite series of symptoms, each of which differed in origin, intensity, and duration. 2. That in many cases inflammation and hæmorrhages of the brain followed the injection of these fluids, and that these cerebral changes followed the more surely and gravely the greater the chemical difference of the fluids proved to be. From this it follows that in these injections some of the fluid must have reached the brain, and there given rise to these changes. The probability is that these fluids, injected into the tympanum, passed into the labyrinth through the round window, and thence through the aquæductus cochleæ to the brain. Two factors he considers to be necessary for the production of vertigo: first, a certain pressure, and, secondly, an irritation, which may be produced by the chemical property of the fluids or their low temperature, or by the high pressure of warm neutral fluids. He found that whenever nystagmus appeared after the drum had been filled with fluid, the latter had passed through the round window into the labyrinth, and thence through the aquæductus cochleæ into the subdural space. In Baginsky's opinion, the symptoms occurring after injection of fluids into the drum are due solely and entirely to a lesion of the central organ. The labyrinth has nothing directly to do with disturbances of equilibrium; the latter arise solely from an attack upon the brain. If the lesion here is not severe, they soon disappear; but if the brain has been seriously injured, the disturbance of equilibrium may last for an indefinite time. The cause of the rotation of the head is therefore always an affection of the brain, either hæmorrhages or consecutive inflammations; and it has nothing whatever to do with division of any fixed semicircular canal. The isolated injury of the semicircular canals without reaction upon the brain Baginsky regards as impossible. Neither the primary nor the secondary symptoms point to the semicircular canals as peripheral organs of the sense of equilibrium.

15. Spencer has a short paper upon *the connection between giddiness and middle-ear disease*, in which he cites three cases as supporting the theory of vaso-motor innervation. He thinks that in a large proportion of cases of chronic inflammation of the middle ear it will be found that at some time or other, under the influence of some peripheral irritation, the phenomenon of giddiness has manifested itself. Therefore, in every case of giddiness, the middle ear should be examined for the revelation of at least one of the disturbing elements.

17. According to Lacharrière, the symptoms of *engorgement of the chain of bones of the ear* are of two kinds. Those appreciable by the physician are, first, deformities in the drumhead, and, secondly, abnormal vascularity of the chain of bones and immobility of the articulations. The subjective symptoms are: 1, Loss of hearing; 2, conditions in which the sense of hearing seems to awaken; 3, tinnitus. According to the causes of the affection, the drum membrane has preserved its transparency, and the mucous membrane has been the seat of an inflammation which has been the point of departure of a fibrous or sclerosed transformation which causes opacity as well as thickening. The most marked feature in these cases is the prominence of the handle of the hammer, and on each side of it are seen fibrous striæ proceeding toward the tympanic circle. Such lesions cause considerable deafness because sonorous vibrations can not be conveyed through the bones in this condition. If such an ear be auscultated while the patient expires deeply with mouth and nose closed, a fine crackling may be heard. The engorgement of the chain of bones is grave because it provokes progressive deafness. Generally, the course is a slow increase from day to day to a more or less complete deafness. The best results he has gained from potassium iodide internally in quantities of fifty centigrammes daily. Besides this, he advises that the auditory canals be filled with a warm solution of the same on going to bed. He also inflates the Eustachian tubes and middle ears with air charged with vapor of iodine.

21. Bezold calls attention to a small class of cases of *suppurative otitis media with pus formation in the mastoid*, where the process has begun in the air-cells of the mastoid and has subsequently spread to the tympanum. With the ordinary symptoms of middle-ear trouble and marked diminution of the purulent discharge from the tympanic cavity comes a marked increase of all the symptoms pointing to the mastoid process. The pus extends beneath the periosteum in every direction, forward upon the lower jaw, downward into the tissues of the neck, and backward upon the occiput. The point of perforation of the mastoid by the pus must be looked for upon the inner surface or in the incisura mastoidea, and not in the usual locality. In trephining for pus in these cases, Bezold holds that the trephine and chisel must be applied much lower down upon the mastoid process, and the bone must be perforated through its entire thickness, as far as the incisura mastoidea.

22. Czarda recommends strongly the introduction of *the antiseptic principle in aural therapeutics*, and speaks especially of an antiseptic artificial drumhead. His "silk tympanum" consists of a single or double fold of "silk protective" with a single hole, strengthened by macintosh or parchment-paper, made to adhere by collodion or some cementing substance. This is introduced by means of a tube into the external auditory canal. In acute otitis media purulenta it may be used as an obturator, by first insufflating a small amount of boracic acid, then introducing the silk drumhead not quite as far down as the real membrana tympani, then partially filling the canal with boracic acid, and closing all with a cotton plug and bandage. This can be readily changed by withdrawing the silk tympanic membrane and with it all the boracic acid in front of it, and then reapplying a fresh dressing. He speaks highly of the results gained by this method of treatment.

27. Adams's paper on *the anatomical connection between abscess of the brain and aural disease* is interesting from the pathological standpoint. He thinks that aural diseases are more frequent in the early than in the later stages of life, and that suppurative discharges from the ear follow the same law. He also holds that abscess or suppuration of the brain, whether encysted or diffuse, is much more frequent in advanced life than at an early age, which is contrary to what is currently believed. He is right in calling attention to anatomical peculiarities of structure in the organ of hearing in the infant and in the adult, which explain the greater frequency of abscess of the brain in adult life as originating from disease of the ear; and that under certain conditions there is an abnormal state of the cerebral circulation which admits of a direct vascular connection between the ear and the brain. Whatever the age of the patient, there is abundant evidence that diseases of the ear originate a large proportion of cases of abscess of the brain. The question naturally arises, since children are more subject to aural discharges, and since aural disease is the most frequent originating cause of abscess of the brain, Why should children be so largely exempt from liability to abscess of the brain? Adams thinks the explanation will be found in considerations arising from a comparison of the structure of the organ of hearing in the child and in the adult. In nearly its entire thickness the mastoid process of the child forms a barrier of bone extending backward between the tympanic cavity and the groove on the inner wall of the temporal bone for the lateral sinus. In the adult the mastoid process is large and projecting, and is hollowed out into numerous cells, which are in communication with the tympanic cavity. There is only a thin screen between the large cells of the mastoid and the lateral sinus, and not infrequently there is no osseous barrier. In the child, at the outer surface of the temporal bone, where the squamous unites with the mastoid portion, the line of junction is only partially ossified and often so defective as to permit of the ready formation of an opening, through which at times the purulent contents of the tympanum and antrum are discharged spontaneously. But in the adult this suture is completely ossified, and the outer layer of bone has become very dense. Hence in the child the tendency of the suppurative flow is almost entirely outward, because the purulent matter finds less hindrance and a readier vent to the external surface through the thin and imperfect suture between the squamous and mastoid portions of the bone, behind and close to the meatus. In the adult, on the contrary, irrespective of actual caries or of necrosis of the temporal bone, the walls of the lateral sinus are exposed to irritating influences propagated from the tympanum and mastoid cells. The lateral sinus may become inflamed, may receive septic matter carried from the tympanum and mastoid cells, and may become more or less occluded through various causes. But, whatever the cause of obstruction, the flow of blood is arrested just as it should pass out of the cranium into the internal jugular vein. The venous blood, thus intercepted or retarded, must then reverse its normal course and go to swell the stream flowing through the sinuses on its way to the heart by the internal jugular of the other side. But from their structure the sinuses are practically non-dilatable, and therefore every collateral channel is overtaxed to carry off the accumulating blood. The superior petrosal sinus on the affected side, which is fed by veins from the inferior surface of the middle cerebral lobe, and also by veins from the tympanum and middle ear, is the first to become overcharged. As the obstruction is distal to the entrance of the cerebral and cerebellar veins already referred to, they also become turgid, and also have their normal flow reversed more or less. They are then liable to convey some of the blood which was intercepted at the lateral sinus into other sinuses, such as the inferior petrosal or longitudinal. These veins, however, are dilatable and have exceedingly thin walls, which under distention are liable to become varicose. The effect of this distended, varicose condition is a continued and localized pressure upon the delicate surface of the brain. Adams regards it as clearly evident that blood flowing from the tympanum or internal ear can, under the conditions specified, pass directly into the lateral or petrosal sinus, and from thence by the cerebral veins directly to the surface of the brain.

34. Gottstein has a further contribution to *the neuropathic form of Ménière's disease.* He connects the so-called otitis labyrinthica with epidemic cerebro-spinal meningitis, for when the latter subsided the number of cases of labyrinthine otitis markedly diminished. In all the cases which came under his observation, in which there had been marked meningeal symptoms, the latter always preceded the aural symptoms. As a result of his observations Gottstein has come to doubt the existence of a genuine otitis labyrinthica. He doubts whether the group of symptoms dubbed with this name can be referred to an inflammation of the labyrinth; and he is inclined to believe that these symptoms, known more recently as Ménière's complex of symptoms, are all signs of an affection of the trunk of the acoustic nerve, due to meningitis.

35. Bartolozzi describes at some length a species of inflammation in the auditory canal which he calls *otitis externa pseudo-membranosa*, and he divides cases of this lesion into two varieties. In one the walls of the external auditory canal are lined with a whitish, fibrous, slightly elastic membrane, thinnest at the meatus, thickest at the bottom of the canal and on the drumhead, where it sometimes measures a millimetre or more in thickness. In the second class the entire auditory canal is filled with a plug, which presses more or less firmly against the drumhead. The cause he considers to be a dermatitis exfoliativa. It occurs most often in adults and old people, and but rarely in children. He has seen ninety-five cases in thirty-four years of practice. [This is not a new disease, as all aurists occasionally see cases of this nature; and it is by no means an uncommon sequel of eczema of the auricle and auditory canal.]

36. McBride's paper on *nervous deafness* is a plea for the importance of the functional element in the causation of deafness. He assumes the functional element to be present when, in cases of chronic deafness due to changes in the middle or internal ear, variations in the hearing power occur and are produced by causes which are unlikely to act upon the pathological condition already existing. Two possible explanations as to the manner in which the state of the system reacts upon the organ of hearing are as follows: 1. The auditory nerve may become impaired in its function by sharing in the general nervous depression. Whether these functional derangements of the auditory nerve are often or always due to changes in the blood supply we can not tell. 2. It is quite possible that in the kind of cases we are considering the tympanic muscles may share in the general atony or even suffer more, and that the factors of deafness may be in part the same as in the form described by Woakes under the name of paretic deafness. While attributing the increased impairment of hearing chiefly to neurasthenia of the auditory nerve as part of a general neurasthenia, we must not forget that it may be due in part to atony of the tensor tympani as part of a general atonic condition of the muscular system.

37. Baratoux reports the results of *the autopsy of a deaf mute, with special reference to the auditory nerve and medulla.* The nerve was the seat of parenchymatous neuritis. In following its nervous filaments as far as the medulla it was found that the fibers of the nerve of space, or that branch which goes toward the cerebellum, showed no morbid alteration, but that the ganglion situated upon the circumference of the cochlear nerve was degenerated. The cells of this ganglion had in part disappeared; its vessels were more numerous than in the normal state, and presented, besides, very marked varicose dilatations, which indicates that the interstitial sclerosis was propagated to the walls of the capillaries. Baratoux believes with Luys that the fibers of the posterior root ascend as far as the convolutions of the posterior regions of the optic layer.

39. In speaking of *the use of electricity in ear disease,* Woakes thinks that Brenner's conclusions may be combated on the ground that the auditory nerve is probably not reached by the current at all. He recognizes clearly the paramount import of muscle-paresis as a chief factor in the causation of deafness and its concomitant symptoms in a very large proportion of those cases of the disease which occur in adult life. Even in this class of cases the use of electricity is a limited one, for, while the application of the electric current will tend to restore the motive power of the muscles to which it is applied, it will at the same time perpetuate, if not increase, the already existing congestion of the middle ear. This is the reason why deaf patients subjected to the treatment in question fail to experience results proportionate to the restoration which we know has accrued in the muscle power of the tube in consequence of the successful electrization. Woakes has nearly abandoned the constant-current battery for therapeutic purposes, and uses most frequently a very weak induced current, and never repeats the application oftener than once a week.

QUARTERLY REPORT ON ANATOMY AND PHYSIOLOGY.*

No. III.

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2. Merkel thinks that *the daily variation in the height of the human body* amounts in the extreme to five centimetres. Shortening to this degree, occurring in the evening, after the maintenance of an erect posture during the day, is due to compression not only of the intervertebral disks, but also of the articular cartilages in the great joints of the extremities. The latter fact was proved for the hip joint by the observation that in the recumbent posture the trochanters were more widely separated than when the erect position was assumed.

3. Edgren, in a long and elaborate paper on *the conditions of temperature in the peripheral organs*, discusses the results obtained by previous observers, and gives an account of his own experiments made with the assistance of a thermo-electric apparatus. He gives the following summary of his results: (1) Sensory impressions in general, whether tactile, visual, or auditory, cause a transient fall of temperature in the lower extremity; but (2) sensory stimuli applied to the same foot cause an elevation of temperature; (3) section of the saphenous nerve has no effect upon these phenomena; (4) section of the sciatic nerve upon the same side prevents the fall of temperature noted under (1); (5) section of the saphenous nerve produces no change in temperature; (6) irritation of the saphenous nerve produces slight cooling both upon the sole and the back of the foot; if at the same time the sciatic nerve is divided, the back of the foot becomes warm, while the sole remains cool; (7) section of the sciatic nerve produces a transient and slight cooling of the foot, which is succeeded by a marked and persistent elevation of temperature, which again gradually abates on the following day; (8) irritation of the recently divided sciatic nerve produces a considerable fall of temperature, which lasts only so long as the irritation is kept up; prolonged irritation lowers the temperature to or even below the point at which it stood before the nerve was cut; (9) irritation of the saphenous nerve on the day after it has been divided causes a slight fall of temperature in the foot, but if applied later it has no perceptible effect; (10) irritation of the sciatic nerve one or more days after section may produce either cooling or warming, or it may have no effect; which result takes place depends upon the time which has elapsed since the nerve was cut, not upon the initial temperature of the foot at the time of the operation; (11) direct inspection of the vessels has shown that the sciatic is the vaso-motor nerve not only of the anterior tibial artery and its first branches, but also of the lower part of the saphenous artery and its branches; (12) the conclusion to be drawn from these results is that the saphenous is a vaso-constrictor nerve, the sciatic both vaso-constrictor and vaso-dilator. The existence of vaso-dilator fibers in the sciatic is proved by (10), which demonstrates their activity after the degenerative processes consequent upon section have abrogated the function of the vaso-constrictor fibers.

4. Sheard injected sulphindigotate of sodium into the veins of a number of rabbits, and then killed the animals at times varying from ten minutes to four hours after the operation. Microscopic examination of the kidneys showed that there had been *direct excretion of pigment by the intercellular substance of the uriniferous tubules*, without its first having passed into the epithelial cells. The cells, it is true, were stained; but this was due to contact with the coloring matters subsequent to excretion. Injections with ammonio-carmine gave the same result. The author concludes that the cells of the tubules secrete only the urea and the salts of the urine which are insoluble in water.

5. Some *anomalies in the formation of the skeleton* are here described. They include: 1. A single case in which a portion of the sphenoidal fissure near its inner angle was shut off from the rest by a bridge of bone; 2. Three cases in which there was a fifth cranial bone filling up the anterior fontanelle—Gruber has observed this anomaly in seventy-three instances; 3. Two cases in which the arcus temporo-maxillaris intra-jugalis [zygomatic fossa?] presented a fifth bone on each side; 4. A case, the fifth which Gruber has observed, in which the styloid process [prominent external basal angle] of the third metacarpal bone was replaced by a process jutting from the trapezoid; 5. Two cases, in addition to nineteen already described, in which the styloid process of the third metacarpal bone was replaced by a supernumerary carpal bone.

8. Farabeuf thinks that we should consider *the sterno-mastoid a double muscle.* According to him, it consists of two parts quite distinct throughout very nearly their whole extent: a superficial, or sterno-cleido-occipito-mastoid, and a deep, or cleido-mastoid portion.

9. In four subjects out of eighty-eight, examined by Anderson, *the subclavius muscle*, while of normal origin, had an insertion into both the clavicle and the coracoid process. In another case this muscle arose by two heads from the first and second ribs, the insertion in this case being normal. A perforating branch of the internal mammary artery passed between the two heads.

10. Dubar reports a single case in which *a supra-clavicular muscle* was found on post-mortem examination. This was attached by both extremities to the clavicle, and above was in intimate connection with the superficial layer of the deep cervical fascia, so that its function would appear to be that of a tensor to this membrane. As, however, this is the only instance of the kind on record, such a function must possess little importance.

11. Anderson found in one case a new muscle, which he describes as *an accessory tensor of the plantar fascia.* Its origin is by tendinous fibers from the inferior extremity of the popliteal [oblique] line, and from the posterior [internal] border of the tibia as far as its lower third. Its insertion is into the os calcis between that of the abductor pollicis and that of the plantaris muscles, and also by some fibers into the plantar fascia.

12. Polaillon describes two cases of *congenital absence of a portion of the diaphragm*, with resulting displacement of the viscera and death soon after birth. The chief signs of such an occurrence are respiration of a thoracic type, with considerable dyspnœa, cardiac displacement, and intra-thoracic borborygmi. Death usually results from compression of the lungs, although involvement of the heart may hasten the end if the malformation is situated upon the left side, as was the case in twenty-three out of the thirty-seven cases recorded.

13. Loven, in an article on *the nature of voluntary muscular contractions*, reviews the three existing theories which place the stimulus to contraction (1) in a continuous discharge of nervous energy, (2) in a series of rhythmical discharges occurring eighteen to twenty times a second, (3) in a discharge which is transmitted at different times through the different nervous fibers going to a muscle. The second theory, which was championed by Helmholtz, has been since partially abandoned by him, as he acknowledges that the sound heard during a muscular contraction, and whose pitch had been thought to indicate the rapidity of the fibrillar vibrations, is generated rather in the ear of the observer than in the fibers of the muscle. Loven's experiments with the capillary electrometer seem to prove that, both in voluntary contraction and in the tetanic spasm of strychnine poisoning, there is a series of rhythmical excitations taking place at the rate of eight a second. He explains the apparently continuous character of the contraction by supposing that each separate excitation takes some time for its accomplishment. This supposition, if true, may explain why a muscle, when undergoing voluntary contraction, does not excite an induced current in a "rheoscopic" frog brought into contact with it.

14, 15. Poole believes that *contraction taking place in a muscle is due to the release of an inherent power normally kept in check by the nervous influence.* Accordingly, a stimulus capable of producing contraction is not to be regarded as something which increases nervous force, and thus excites a muscle to the performance of its function, but rather as something which diminishes an inhibitory nervous influence, and thus allows a muscle to follow its natural tendency, before kept in subjection. He also denies the possibility of stimulating a muscle without at the same time acting upon the nerve. ═══ In a second paper, he insists that *curare paralyzes only the motor centers and the nerve-trunks*, leaving the end-plates intact, and that, therefore, in this case also, so-called stimulation of the muscle is really an action exerted through the nerves.

16. Arndt, in his paper on *the red blood corpuscles of vertebrates*, makes the following statements: 1. The corpuscles of fishes, birds, and reptiles are not nucleated in the natural condition, but become so as the result of post-mortem change; 2. The reticular structure which has been described in the nucleus and body of the corpuscles is an optical illusion caused by the presence of granules of "nuclear matter" overlying each other at different depths; 3. The corpuscles are vesicular in character, and may possess a membrane distinct in structure from the body of the cell; this, however, occurs in only a minority of the cases, as most corpuscles perish before acquiring a membrane; 4. The red corpuscles, under the influence of suitable reagents, and in disease sometimes spontaneously, exhibit amœboid movements, and are capable of division. [Nucleation of the red corpuscles has been observed in the veins of the living frog, so that it can scarcely be called a post-mortem phenomenon. Again, nearly all histologists, with the exception of Richardson in this country, and some few abroad, not only have failed to recognize an enveloping membrane, but have brought forward good reasons for its non-existence. The power of amœboid activity, upon which Arndt lays so much stress, seems hardly compatible with the stability which the red corpuscle exhibits, and the small amount of protoplasm which it contains. It is possible, however, that in morbid states fission of the red cells may take place, and Ganle and Dowdeswell have shown that the fragments so formed bear a great resemblance to bacteria and micrococci, and especially to the "spirochætæ" of relapsing fever. The pathological interest attaching to this resemblance is obvious.]

17. Fellner agrees with Stricker in considering *the red blood corpuscle* as made up of a large intra-cellular body surrounded by a very thin concentric ring of a different material; but he differs from some other physiologists in asserting that this central body is not a nucleus properly so called. The reasons for this opinion are that the central body is found coincidently with a nucleus in embryonic blood corpuscles, and that its special affinity for coloring matter is not as strong as that of nuclei generally. He distinguishes two classes of embryonic red corpuscles, one in which the nuclei are large and the coloration faint, and a second in which the nuclei are smaller but the coloration more marked. The latter are probably more developed stages of the former. Of the theories regarding the evolution of adult from embryonic corpuscles, he looks with most favor, apparently, upon that which holds to the gradual disintegration and solution of the nucleus within the cell; while the actual escape of the nucleus from the cell, as observed by Rindfleisch, he believes to be a post-mortem phenomenon.

18. Newman's *instrument for measuring the amount of pigment in solution* consists essentially of two tubes sliding into each other, as in a telescope, with a spectroscope attached to the inner tube. The fluid to be tested is introduced into the tubes, and forms a column whose length can be varied at will by pushing in or drawing out the inner tube. In testing for hæmoglobin the apparatus is adjusted till the fainter of the two lines in the absorption spectrum just disappears. The column of fluid is then known to be equivalent to a solution containing one part of hæmoglobin to 22,000 of water, in a layer two centimetres thick; and a comparison of the latter thickness with the length of the column will show the amount of pigment contained in the latter. A similar procedure may be applied to the estimation of urobilin. [This instrument is in principle very like Bizzozero's chromocytometer, except that in the latter the degree of absorption is measured not with the spectroscope, but by the tint of the fluid examined.]

19. François-Franck, in an interesting review of the bibliography of the subject, shows that, in accordance with the most recent views, we must regard *the rhythmic action of the heart* as a function of the muscular fibers themselves, and capable of being produced without the intervention of a nervous impulse; while the cardiac ganglia are still essential for the maintenance and regulation of this action.

21. Martin and Sedgwick have been able to obtain tracings of *the blood pressure in the coronary arteries*, and to compare these with tracings taken simultaneously from the carotids. The two showed such a close agreement, even in the minutest points, that it was evident that the alterations of pressure in the two arteries were due to the same cause. Accordingly, the rise in pressure in the coronary arteries during the heart's systole must be caused, as in the case of the carotid, by the rise in pressure occurring in the aorta. This at once disproves the prevalent theory that during the systole the orifices of the coronary arteries are covered by the semilunar valves, and that, consequently, blood does not pass into these vessels from the aorta till the valves close and the diastole has begun.

22. Homolle reviews the apparatus of Waldenberg and of Busch for determining with precision *the blood pressure in man.* In the angiometer of Waldenberg the oscillations of the vessel are conveyed through a complex mechanism to two indices, which register both the degree and the force of the expansion. The latter represents the force of arterial tension, which, as Waldenberg points out, is quite a different thing from the blood pressure. The blood pressure, however, can be deduced from the arterial tension by subtracting from the figure denoting the latter quantity the tension of the vascular wall itself, a quantity which can be experimentally determined. The angiometer appears, from Homolle's description, to deserve his characterization as too complicated, and liable to too many sources of error to become available for practical purposes. The pressure, as deduced from its use, ranged under normal conditions from 200 to 268 mm. of mercury, which would seem to be rather high. Busch's instrument, the sphygmomanometer, consists essentially of a mercurial column, connected through fluid with the exterior of an artery, and registering by its height the pressure required to abolish the vascular pulsation. It would appear to be both more simple and more accurate than the angiometer. The average blood pressure registered by it ranged from 145 to 180 mm. of mercury.

23. Hayem observed *the process of coagulation* by spreading a thin layer of blood upon a slide and watching the formation of the fibrinous reticulum. The red corpuscles were washed out by a stream of water, and the reticulum was treated with coloring matters and with "Hayem's fluid". [a solution of corrosive sublimate with sodium sulphate and sodium chloride]. At the moment when coagulation took place he noticed an outgrowth of fibrils from the "hæmatoblasts" [embryonic red cells], which occupied the clear spaces between the *rouleaux* formed by the red corpuscles. The white corpuscles, it is to be observed, take no part in the process. These fibrillar offshoots formed a reticulum which in normal blood was so delicate as to be scarcely perceptible. In inflammation, however, the fibrillæ were much coarser and more numerous, and on the addition of "Hayem's fluid" there were formed large masses of granular or fibrillated matter which contained many hæmatoblasts. These masses are regarded by the author as characteristic, and are termed by him "inflammatory plates" [*plaques phlegmasiques*]. In spite of the excess of fibrinous matter, coagulation occurred more slowly in inflammation than in health. In the former condition the white corpuscles were increased, and at the crisis there was an abrupt development of a large number of hæmatoblasts. All these phenomena were apparent in inflammation of every kind, whether acute or chronic, simple or specific. If complicating one of the fevers or a disease of the hæmorrhagic diathesis, inflammation still affected the blood in the way above described; but if it was not present, the coagulability of the blood in these states was not altered. In typhoid fever, contrary to most observers, Hayem found a decrease of white corpuscles, associated with a progressive diminution of hæmatoblasts. In cachexiæ he found a large increase of hæmatoblasts; and *plaques cachectiques* like the *plaques phlegmasiques*, but smaller and more granular, were observed.

24. François-Franck recognizes the existence of a *venous pulse* in three distinct localities: 1. In the superficial veins of the extremities, where it is due to an impulse communicated through the capillaries [and hence has a rhythm nearly corresponding to that of the arterial pulse]; 2. In the venous channels existing in such of the internal organs as are inclosed in an unyielding envelope, as in the brain, the eye, etc. In the brain, as Mosso has recently demonstrated, room is made for each fresh accession of arterial blood not by displacement of the cerebro-spinal fluid, but by a simultaneous contraction of the veins. Accordingly, the veins in this organ, and in the others of the same class, present a true pulsation, which alternates with that of the arteries. 3. Pulsation occurs in those veins which are closely connected with an artery and lie with it in an unyielding sheath, fibrous or osseous. Here each dilatation of the artery necessitates a compensatory contraction of the veins. The pulsation thus induced by rhythmical compressions and relaxations may be of assistance in maintaining the flow of blood through the veins.

25, 26. The first of these articles is noteworthy because of the immense amount of labor which the accumulation of its data required, and, further, because this labor was performed by a woman. *The circumference and thickness of the walls of various arteries* were determined in eighty-one subjects. The arteries measured were the pulmonary, the aorta (in three places), the carotid, the subclavian, the brachial, the radial (in two places), the femoral, and the renal. In each locality the diameters of the three coats were taken separately, and each measurement recorded represents the mean of at least twelve made. It will be seen that Schiele must have made, at the lowest estimate, upward of forty thousand separate determinations. The results are given in full in four tables. The author lays little stress upon the deductions to be drawn from her observations, yet some are given as apparently well substantiated. Thus, in general, as an artery diminishes in size its wall becomes relatively thicker, and this increase of thickness is found especially in the middle coat. A similar increase occurs as age advances, and is again especially marked in the middle coat. Up to the age of fifty the pulmonary artery is larger than the aorta, but later in life it is of equal or smaller dimensions; this change of relation, however, occurs somewhat later in women than in men. In pernicious anæmia and other diseases attended with great emaciation the walls of the arteries are thin and their caliber is small, showing that, like the other tissues, they suffer from the effects of the general atrophic process. ═══ Beneke's attention, as he says, was called to this paper by the strictures contained in it upon his own conclusions. He shows, however, that there is less discrepancy than the author had believed; and he points out some numerical errors which vitiate to a certain extent the deductions which Schiele made in regard to this matter. The points about which a discrepancy had been thought to exist were his assertions as to the great relative caliber of the arteries in subjects affected with cancer and the large size of the pulmonary artery in proportion to the aorta in phthisical patients. He also controverts Schiele's statement that a delicate build of body is necessarily associated with small organs, and *vice versa*.

27. Green examined sixteen skulls, and found *the mastoid foramen* present in all but one. In one skull it was present on one side only. In size it was generally either 2 or 3 mm. in diameter (twenty cases), although in one case it reached 5 mm., and in four was only half a mm. In twenty cases it was situated at the level of the auditory meatus, in two cases above this line, in six cases below it, and in one instance was situated on the base of the skull.

28. Jones asserts that the *lymph hearts* observed in the tail of the eel and the thorax of the frog do not communicate a true pulsation to the veins into which they empty. In the case of the frog the vein has a movement synchronous with that of the lymph heart, but this does not consist in an alteration in caliber, but in a to-and-fro motion of the whole vessel, caused by its intimate connections with the lymph heart.

29, 30. Flint repeats the statement, familiar to the readers of his "Physiology," that *the rhythmic impulse which excites a respiratory movement* is not due to a reflex stimulus originating in the lungs or in the general system, but to a direct excitation of the medulla by contact with unaërated blood. Alterations in respiratory rhythm are, however, probably of reflex origin, the stimulus in most cases being transmitted through the pneumogastric. ═══ Gradle, in a recent lecture, agrees with Flint in considering the medulla the place where the want of air is perceived, and in attributing alterations of rhythm to reflex action. He differs from Flint in believing that we have as yet no sufficient explanation for the alternation of respiratory movements. He further asserts that there is no anatomical basis for the existence of *a distinct respiratory center in the medulla;* the spot where this is usually located being devoid of nerve-cells and containing conducting fibers only. Moreover, respiration may be carried on after this "center" is cut off from connection with the respiratory apparatus. He is, therefore, inclined to consider the act of respiration as the result of the coördinated action of a series of centers scattered throughout the cord. He enumerates experiments which tend to disprove the existence of a distinct expiratory center, the alternate excitation and depression of the inspiratory center being sufficient to account for the succession of respiratory movements. This excitation and depression may be effected by the pneumogastric, for fibers inhibiting both expiration and inspiration have been traced in this nerve, the latter being found especially in its superior laryngeal branch.

31. Hayes believes that *the posterior crico-arytenoid muscles* consist of two distinct parts, each of which has a separate function. One portion performs the office, generally assigned to the whole muscle, of rotating the apex of the arytenoid cartilages outward. The other portion separates the arytenoid cartilages by drawing each bodily outward. In a case of pharyngeal ulceration observed by the author the two portions of the muscle were paralyzed in succession, and laryngoscopic examination showed a progressive abolition: first, of the power of external rotation; secondly, of the power of abduction. As confirmatory of the existence of a double function in the muscle, Hayes quotes Luschka, who describes the supplying nerve as bifurcating before reaching its distribution. [Sappey also says that the supplying nerve is frequently double.]

32. The rare occurrence of *a crepitant râle in a perfectly healthy condition of the lungs* is here noted. It is present most frequently in the supra-clavicular region, and is ascribed by Renzi to the dilatation of a few lobules which may be normally in a collapsed condition. Accordingly, it is only heard when the patient begins to breathe, and not in the ordinary respiration which he keeps up afterward.

33. Wertheim, from experiments made upon twelve human subjects, concludes, in opposition to the results obtained by Leyden and Fränkel with dogs, that *in fever the rate of tissue-oxidation is below the normal.* This conclusion is based on the fact that, while the total quantity of expired air is greater in febrile conditions than in health, the percentage amount, and, in general, the absolute quantity of carbon dioxide given out, are diminished.

34. Laborde has experimented upon artificially induced *asphyxia.* He finds that a considerable interval of time exists between the supervention of apparent and of actual death. The former is marked by cessation of respiration and absence of sensibility, but the heart-beat, though feeble, is still apparent at intervals, and the animal can still be resuscitated by artificial respiration. The duration of the interval during which the animal can still be roused is not stated.

35. *Gudden's method of investigating the anatomy of the central nervous system* consists in extirpating various organs in very young animals, and in observing the atrophy which subsequently takes place in the nerves distributed to the part extirpated. It seems especially applicable to the cranial nerves, degeneration in which has been traced as far as the immediate nuclei of origin. [The principle of this method is not new; Bourdon employed it to locate the cortical centers for the movements of the extremities, and others have from time to time attempted to locate the nervous center governing a special function by noting the extent of atrophy consequent upon abolition of the function.]

37. Landolt has pointed out the usual *association of asymmetrical development of the cranium with a corresponding inequality in the refraction of the two eyes.* The eye which has the lower refraction is found on the side which shows less prominence both of cranium and face. Hypermetropia is regarded by the author as a species of arrested development, since it is also more common in the eye of the less developed side.

38. Nicolucci's article on *the weight of the brain* is a compilation from various authors, and represents the result of a great number of observations. The average weight of the healthy adult brain is stated at 1331 grammes [47 oz. avoird.] for males, and 1189 grammes [42 oz.] for females. This weight attains its maximum between the ages of twenty and thirty, and begins to decline after fifty; although in intellectual people the maximum is maintained for a longer period. The diminution between early manhood and old age amounts to 79 grammes [2¾ oz.] in men, and 67 grammes [2⅓ oz.] in women. If the researches of Scotch observers are to be trusted, their nation has the weightiest brains of any European people; next come the Sclavonian races, the French, English, German, and lastly the Italians. The cerebellum ranges from 11 to 13 per cent. of the weight of the cerebrum, and is proportionally lighter in women. Its weight, with that of the medulla and pons, varies little with the race; while the cerebrum is heavier in the brachycephalic than in the dolichocephalic races. The medulla and pons together weigh 26 grammes [401 grains] in men, 23 grammes [355 grains] in women. A constant preponderance of either cerebral hemisphere over the other has not yet been satisfactorily made out.

39, 40. Hammond claims to have discovered a collection of *giant nerve-cells in a non-motor area* of the cat's brain. The discovery is of interest as tending to refute the idea that these giant cells are always indicative of a motor function. Moreover, he found that these cells did not occur in isolated groups, but were scattered more or less abundantly throughout the brain. The corresponding area in the human brain was found to present similar cells.

41. Exner gives a very valuable *résumé* of the results afforded by clinical observation in regard to *cerebral localization.* Out of several thousand cases of cerebral disease with loss of function, he found only 168 available for his purpose. The significance of the results which he obtained was indicated graphically by an ingenious method. In all cases he found that the centers for any particular function were more extensive upon the left hemisphere than upon the right, and extended farther posteriorly in the former case. The author enunciates the general rule that muscles which are brought into action simultaneously during life are governed by the same center, whether they have the same direct innervation or not. The center for the "word-deafness" of Kussmaul he places in the second temporal convolution, that for amnesic and ataxic aphasia in the third frontal convolution. The reason for the existence of the center for articulation in one hemisphere only he conceives to be the impossibility of speech in case there were any slight difficulty in coördinating the muscles of phonation, such as might occur if there were two centers acting separately. In regard to the way in which we are to interpret the action of nerve-centers, he says that it is absurd to suppose that a certain portion of the brain surface has for its only function the regulation of a certain group of muscles. That the action is much more complex is shown by the fact that the centers merge into each other, and the influence of each seems to grow less as we approach the neutral ground where two centers overlap. The centers differ also in sensitiveness, that for the lower extremity being less susceptible to the effects of injury than that for the upper extremity.

42, 43. Pasternatzky, as the result of experiments upon dogs, cats, rabbits, and foxes, confirms the existence of *cortical motor centers* in the brains of these animals. He thinks that they are located in the gray layers of the cortex, and not in the white substance lying immediately beneath, as is held by some. He also believes that in their nature these centers are neither purely motor nor purely sensory, but act by a process which we do not yet understand, but which probably presents a form of nervous action intermediate between sensation and motion. ═══ Brown-Séquard holds to the view that *cortical centers are not psycho-motor, but reflector-motor.* He states that the path for the transmission of motor impulses from these centers passes through the corpus callosum, where it decussates, and also through the internal capsule and the peduncles.

46. Dalton recounts two experiments undertaken by himself which show that *the center for visual sensibility* is situated in the angular gyrus. Extirpation of this center produced blindness of the opposite eye without altering its sensibility or the reaction of the pupil to light, or producing any effect upon intelligence or power of motion. In his experiments, which were made upon dogs, the blindness was permanent; in those of Ferrier, made upon monkeys, it was transitory. In other respects the results of these two observers were in agreement.

47. The *development of the scala media cochleæ* takes place by the following succession of processes: 1. Involution of a portion of the external surface, forming the otocyst, or ear-vesicle, lined with ectodermal epithelium; 2. Formation of a tubular prolongation from the otocyst, which is at first straight, then becomes twisted upon itself, and becomes somewhat flattened so as to present an oval section; 3. Thinning of the epithelium upon the upper side of the tube to form the inferior layer of the membrane of Reissner; 4. Formation of two ridges upon the lower side of the tube, the larger of which develops into the lining of the sulcus spiralis and also forms the membrana tectoria, while the smaller ridge forms the organ of Corti. The latter consists essentially of four structures—the inner hair cells, the rods of Corti, the outer hair cells, and the external apparatus of support.

48. Brown-Séquard has made experiments in *excitation and inhibition by nerve-stimulation*, illustrative of the fact that the same stimulus may at the same time cause directly an increase in the functional activity of a part, and in a reflex manner an inhibition of this activity. Thus, the introduction of a foreign body (prussic acid) under the skin, the removal of a portion of the central nervous system, or even the section of a peripheral nerve, will depress the action of the diaphragm if the phrenic nerve remain intact, but will greatly heighten and prolong its activity if the phrenic nerve is divided. It is possible that these conclusions may serve to explain the action of counter-irritants and revulsives.

49. Spitzka thinks that *the function of the cerebellum* is to be deduced rather from a consideration of its anatomical connections than from the results of experiment and clinical observation. After describing these connections he states his opinion that the cerebellum is the place where the "impressions of touch and position are associated with those of time and space," and hence is the seat of coördination of the most delicate species of movements, such as are necessary, for instance, to the adjustment of the drum-membrane for the correct appreciation of the pitch of sounds. In filling this position, however, it is quite subordinate to the cerebrum, to which it acts as an "informing dépôt" for coördination, rather than as a distinct center.

50. The *sensory tract to the brain*, according to Spitzka, passes up from the columns of Goll and Burdach to form what Meynert called the sensory decussation of the anterior pyramids, but what Flechsig showed to be the inter-olivary strands, which have no connection with the anterior pyramids, but terminate in the corpora quadrigemina. Flechsig, however, was wrong in denying the existence of a direct tract from this point to the rest of the brain, for, besides the fibers going to the corpora quadrigemina, the inter-olivary strands contain fibers which pass up through the cerebral peduncles, and thence probably to the cortex by way of the internal capsule. [The researches of Debove and Gombault, cited in the last Report (in the April number of this journal, p. 503), seemed to show that the sensory decussation was really in intimate relation with the motor fibers of the anterior pyramids.]

51. Field experimented in regard to *the physiology of the spinal cord* by dividing the cord in kittens (nine experiments). He concludes that coördination impulses are conducted by the posterior columns, tactile impressions by both posterior and lateral columns, voluntary motor impulses by both anterior and lateral columns, and painful sensations and vaso-motor impulses by the lateral columns alone. The lateral columns also contain the inhibitory and sudorific nerves, the latter being placed anteriorly to the former, and both being found in the inner half of the middle third of the column. The gray matter takes no part in the transmission of any of these impulses or sensations. The author also investigated the action of diaphoretic drugs, and concluded that bromide of ethyl, piscidia erythrina, aconitia, and veratrum viride acted upon the central extremities of the sudorific nerves, while lobeline and muscarine stimulated the peripheral extremities. He further corroborated the observations of those who found convulsions to follow irritation of the pons Varolii, and he conducted a series of experiments on the injection of corrosive substances into different parts of the brain, the results of which are too voluminous to be given here.

52. Golgi has made a very interesting communication on *the nature of the connection between nerve fibers and nerve cells.* He states that each nerve cell is connected with a nerve fiber by one of its prolongations only, and in this sense all cells may be regarded as unipolar. The other prolongations are in intimate relation with connective-tissue cells and with blood-vessels, and are regarded by the author as playing an important part in maintaining the nutrition of the nerve cell. The single prolongation which forms the connection between nerve cell and nerve fiber, called by some the axis-cylinder process, by Golgi the nervous process, has a different destiny, according as it is afferent or efferent in character. In the former case it splits up into a fine reticulum of fibrils, which again unite to form the axis-cylinder of the nerve trunk. In the second case the nervous process is directly continuous with the axis-cylinder of the nerve, but gives off in its passage subsidiary fibrils which enter into the formation of the network just described. It is in this reticulum, according to Golgi, that communication is effected between the different classes of nerves, and also between nerves of the same class; and it is here, probably, that that transfer of impulses takes place which constitutes reflex action. He substantiates his statements by the results of examination of the spinal cord, where the difference was marked between the cells in the anterior and posterior portions of the gray substance. He noted that many of the efferent nervous processes passed to the opposite side of the cord before entering into connection with an axis-cylinder.

53. Althaus gives a very good account of *the physiology and pathology of the olfactory nerve.* He details the arguments for and against the prevailing theory as to its function, describes the conditions necessary for the appreciation of odors, and enumerates the morbid processes by which this appreciation may be vitiated. He considers strychnine the best remedy for loss of the sense of smell, and morphine combined with atropine for exaltation of that sense. Besides other uses to which the sense of smell may be put, mention is made of its employment as a means of diagnosis in disease, and a curious list is given of the odors emitted in various morbid states.

54, 55, 56. In the last Report (in the April number of this journal, p. 504) we noticed at some length several articles by Dastre and Morat upon *the vaso-motor action of the sympathetic nerve.* Laffont now denies categorically each one of the assertions made by those writers, and presents his own view of the matter in the following statements: 1. Stimulation of the common trunk of the pneumogastric and sympathetic (in the dog) produces vaso-constriction of the corresponding labio-buccal region; 2. Any vaso-dilatation which may occur as the result of such stimulation is either reflex or a passive process depending upon over-excitation and fatigue of the vaso-constrictor nerves; 3. No vaso-dilator fibers are to be found in the cervical sympathetic of any mammal; 4. The vaso-dilator center for the labio-buccal region is not situated in the dorsal region of the cord; 5. Electric stimulation of the cervical sympathetic does not excite a continuous flow of saliva. These statements he substantiates by experiments in which he makes use of the determination of blood pressure to show that the local anæmia, which he ascribes to a vaso-constrictor action, is not due to any reflex depression of the heart. ═══ In a second series of experiments, which he repeated before the Société de Biologie, Laffont attacks the theory of Dastre and Morat from another side. He shows, in opposition to their experiments, that the vaso-dilatation of the face and tongue produced by asphyxia continues after the sympathetic is divided. While acknowledging that this dilatation is too great to be ascribed to a mere paralysis of the sympathethic vaso-constrictor fibers, he urges that it can not be due to a true vaso-dilator action, as Dastre and Morat claimed, because it still persists after section of all the nervous connections of the part, cerebro-spinal as well as sympathetic. He accordingly attributes the phenomenon to a paralysis of the peripheral vaso-constrictor ganglia by contact with unaërated blood. The existence of these peripheral centers has already been demonstrated by Vulpian. Laffont further remarks that the vaso-dilatation of asphyxia is always preceded by a slight vaso-constriction, provided the sympathetic is intact—a fact which is additional evidence of the vaso-constrictor character of the latter. ═══ Undaunted by this adverse testimony, Dastre and Morat still hold to their former views. In some recent experiments they claim to have traced the vaso-dilator fibers of the labio-buccal region from the cervical sympathetic to the dorsal region of the cord through the anterior roots of the second, third, fourth, and fifth dorsal nerves.

57. *The changes which take place in the eye after section of the fifth nerve* are limited, according to Poncet, to an inflammation of the superficial layer of the cornea and an œdematous process in the more internal layers of the retina. The degenerated nerves of the cornea are, after a time, replaced by a new set having an entirely different arrangement from the old.

58. Bocci having apparently demonstrated the inutility of *electricity for stimulating the action of the stomach* when applied to the abdominal wall, conceived the idea of bringing the electrodes into direct contact with the gastric mucous membrane. This idea he succeeded in carrying into effect both in animals and in the human subject by the introduction of a specially modified form of œsophageal sound. By the application of electricity in this way directly to the internal surface of the stomach an increase was induced both in muscular contraction and in the secretion of the gastric juice.

59. Richet in a recent lecture has given so clear an account of *the chemistry of the gastric juice* that we have thought it best, in order to preserve the connection of his argument, to give all the facts which he adduces, although some are sufficiently well known already. In brief, the steps of this argument are as follows: 1. An aqueous solution of hydrochloric acid does not behave in its chemical properties like gastric juice. Nevertheless, 2. The acid of the gastric juice contains chlorine. 3. The acid of the gastric juice is insoluble in ether; it is not, therefore, lactic acid; and to the objection that this insolubility is due to the way in which the lactic acid is combined, it is answered that free lactic acid, developed in the gastric juice by the addition of a lactate, suffers no impairment of its solubility. 4. Hydrochloric acid which has remained in contact with the gastric mucous membrane no longer behaves like the aqueous solution, but exhibits the chemical reactions of the gastric juice. 5. This change in chemical character must be due to some ingredient found in the mucous membrane of the stomach. Among such ingredients are leucin and pepsin. And it is found not only that hydrochloric acid combines with both of these substances, but that its combination presents chemical properties like those of the gastric juice. 6. Hence he concludes that the acidity of the gastric juice is due to hydrochloric acid combined with leucin, and probably with pepsin. In an additional passage on the character of the ferment in the gastric juice he remarks on the inertness of pepsin which has been extracted by alcohol. He further details some experiments which he made, tending to show that the gastric ferment does not resemble the living ferments of yeast, etc.

60. Albertoni gives an abstract of no fewer than twenty different articles on *the nature of peptones.* Various chemical analyses are presented, which agree pretty well with each other. Danilewsky, it is stated, has proved experimentally the truth of the prevalent notion that the process of conversion of the albumens into peptone is one of simple hydration. The various kinds of peptones differ in the degree to which they rotate a beam of polarized light (Henninger). Facts are adduced to show that the peptones are really the form under which the albuminoids are absorbed; one circumstance demonstrative of this being that when used under their own form as an article of food they fulfill all the purposes of an albuminoid, whether their effects upon nutrition, tissue-production, or excretion are taken into account. The peptones are readily traced in the circulation after their absorption, and are either eliminated or used up in tissue formation in the course of four or five hours. When injected into the blood they tend to prevent the coagulation of the latter. The advantage of employing peptones for nutrient enemata is illustrated by examples. Hofmeister gives a method for estimating the peptones in the urine, and shows that peptonuria occurs whenever there is profuse chronic suppuration in any part of the body. This is explained by the fact that pus itself contains from one third to one per cent. of peptones, and the quantity of the latter increases in any one sample of pus as the cells die and disintegrate. [According to Ludwig, peptones are found in the blood of leucæmic patients—a fact which is indicative of the identity of the white blood corpuscles and the pus cells, and is also confirmatory of Hofmeister's view as to the derivation of peptones from the disintegration of leucocytes.]

62. Smidt has made a number of determinations of *the specific gravity of the liver and spleen*, under the belief that figures so obtained will be more practically useful than those denoting the absolute weight of those organs or their relation to the body weight. In sixty subjects which he examined the specific gravity of the healthy liver in adults was on an average 1·056, but varied between 1·052 and 1·060. In children it was distinctly higher, and this difference was more marked in the case of the liver than in that of the spleen or other viscera. In fatty livers the specific gravity was decreased, and, contrary to expectation, the same was true of waxy and cirrhotic livers. This, coupled with the fact that the absolute weight of the organ increases during digestion, and is greatest during the early stages of development, leads the author to the belief that in the liver the specific gravity is a measure of the degree of functional activity. Similar facts, although less striking in character, hold good in regard to the spleen, the mean specific gravity of which amounts to 1·058 in adults (sixteen cases) and in children to 1·059—1·066 (ten cases).

63, 64. Some interesting facts are brought out in this communication upon *the formation of sugar in the liver.* While it is well known that the amount of hepatic sugar increases after the death of the animal, it has remained for Seegen and Kratschmer to show that the total amount of carbo-hydrates in the liver is also a steadily-increasing quantity. This would show that either the sugar is formed from some other source, as well as from the glycogen and dextrine, or that the latter elements are being constantly renovated after death. The authors adopt the former view. ═══ In this second communication Seegen shows that the liver sugar is apparently not formed from the glycogen at all. This is proved by the fact that in the first hours after death, when sugar-formation in the liver is most active, the quantity of glycogen remains the same. The sugar formed is glucose, and not the "ferment-sugar" produced by the action of saliva or pancreatic infusions upon glycogen. Glucose, it is true, can be obtained from glycogen by treating it with acids, but this process, as the author shows, does not take place in the liver. In diabetes, on the other hand, the glucose found in the urine is formed at the expense of the glycogen in the liver. Hence, while the author believes with Bernard and Dalton that the production of liver sugar is a physiological process, its abnormal production in diabetes is not, according to him, an instance of that physiological process carried to excess, but rather is to be regarded as of an entirely distinct and pathological nature. Clinical experience seems to confirm this view.

66. Gruber has observed cases in which *accessory portions of liver substance* were found in the neighborhood of the liver, but having no connection with the organ. In the instance which he here adduces two such accessory organs were discovered.

67. Ewald discusses *the action of the pancreatic juice in digestion.* Upon starch its action is complex. It transforms the substance into a series of dextrines, of which no fewer than eight have been described, and finally converts these into maltose. There the process stops, as far as the pancreas is concerned, but is apparently supplemented by the action of the intestinal mucus, which has the property of converting the maltose into dextrose and levulose. The action of the pancreatic juice upon fat he conceives to be mainly a process of saponification, and not of emulsification. The soaps and fatty acids after absorption are probably recombined in the intestinal villi to form fats. This idea has received some experimental corroboration. The article closes with a brief sketch of the ways in which the power of the pancreatic juice for digesting albuminoids may be turned to account in the preparation of pre-digested foods.

68. Schetelig concludes, as the result of his observations on *the excretion of lime salts*, that the quantity of the latter in the urine is mainly dependent upon the amount absorbed from the food, and hence upon the degree of activity of digestion and osmosis. Hence their excretion is diminished in acute diseases with failure of digestion, but is not markedly altered in chronic diseases, whether of the nervous system or of the lungs, provided the power of digestion be fair. The absorption of the lime salts is best insured by the use of water in large quantities, together with common salt or hydrochloric acid, along with the food.

69. Duval thinks that *the origin of the kidney* is in a diverticulum of the peritonæum. From this point of view the transference of a renal affection to the peritonæum is to be regarded as a process of metastasis to a structure of similar type. He also observes that the Wolffian body, which, as is well known, is the forerunner of the kidney in fœtal life, is itself preceded by an "antecedent" or "cervical" kidney. This latter organ is developed within the pleuro-peritoneal sac, at a point high in the cervical region, and afterward diminishes in size till nothing remains of it but the Wolffian tubes.

70. As the result of some three hundred autopsies, Chiari finds that, contrary to the generally accepted views of histologists, *adenoid (lymphatic) tissue in the mucous membrane of the genito-urinary tract* is quite frequent; but he also believes that its occurrence in this locality is always indicative of some inflammatory process, and has, therefore, no physiological significance. When present, the lymphatic tissue appears under the form of solitary follicles, such as are found in the small and large intestine.

71. Richet and Moutard-Martin have experimented upon *the physiological action of urea and the ammonia salts* when injected into the veins. They find that a considerable amount of urea can be introduced in this way without producing any injurious effects. The urea passes rapidly from the veins into the tissues, and is then slowly eliminated by the urine, causing an increase in the total amount of the latter fluid, which is relatively greater than the increase in urea itself. While the urea, if thus eliminated, seems innocuous, its intravenous injection causes death to take place more rapidly than usual after nephrotomy. Neutral ammonia salts can be injected subcutaneously in considerable quantities without causing death. When death is produced by this means, the gastric mucous membrane becomes highly ammoniacal, and, if placed in contact with urine, will make it ferment.

72. Mason gives a short account of some experiments on *the hourly variations of the urine* in respect to reaction, specific gravity, total amount, and the proportion of urea. The acidity was found to increase after meals, contrary to Bence Jones's observations; and also to increase with exercise. At no time except during periods of considerable relative inactivity did the urine become alkaline. The total amount and the quantity exhibited maxima toward midday and after each meal.

73, 74. Pilcher's essay on *the anatomy of the parts concerned in tracheotomy* goes very thoroughly over the ground. It takes up each layer of tissues in the order in which it is divided, and enumerates the parts contained in each, with a description of their usual relations and the anomalies to which they are subject. The whole is profusely illustrated. ═══ Symington studied *the trachea* in a section made from a frozen subject two years old. The trachea began at the lower border of the fourth cervical vertebra, higher by one or two vertebræ than in the adult. Its bifurcation was at the first dorsal vertebra, but was probably higher than normal on account of the dorsi-flexed condition of the head. In both this paper and the preceding is mentioned the frequent occurrence of the innominate artery in the pre-tracheal space, where it might run the risk of being wounded in the low operation of tracheotomy.

75, 76. Two curious *articular anomalies* are here described. In the first case the synovial membrane between the internal and middle cuneiform bones of the foot was prolonged up the front of the leg, ending in a cul-de-sac about an inch and a quarter above the ankle joint. The anterior tibial and dorsalis pedis arteries wound spirally about this prolongation, which was also in intimate relation with the anterior tibial nerve. ═══ In the second case a portion of the synovial membrane of the temporo-maxillary articulation had formed a hernial protrusion through the capsule of the joint, and communication between the cavity of this protrusion and that of the joint had been afterward shut off by adhesive inflammation in the neck of the sac.

77. *A mylo-glossus muscle* has been described in four cases. In each the origin was from the internal surface of the angle of the jaw, just below the attachment of the internal pterygoid, and the insertion was into the tongue, near the point where the stylo-glossus is normally attached. In one of the two cases, observed by Gruber himself, the latter muscle was absent. In the other there was *an accessory stylo-pharyngeus muscle* springing from the stylo-glossus and inserted into the pharynx. One case similar to this has been recorded. There was also a superficially-placed plane of muscular fibers connecting the hyo-glossus with the middle constrictor of the pharynx.

78, 79. Gruber describes several types of *variation in the digastric muscle.* In three subjects the presence of a supernumerary belly transformed the muscle into a trigastric. In No. 1 the anomaly occurred on both sides. The regular anterior and posterior bellies were present and had their usual origin and insertion; the supernumerary belly arose from the lower border of the inferior maxilla, at some distance from the symphysis, and was inserted into the central tendon. No case exactly like this has been recorded, although Henle describes a case in which the additional belly, having a similar origin, joined the regular anterior belly before reaching the central tendon. In No. 2 the accessory portion arose from the angle of the jaw and was inserted into the posterior belly of the muscle, which was otherwise normal. In No. 3 the regular anterior belly of the digastric was replaced by two supernumerary bellies, one of which was attached to the lower border of the inferior maxilla, the other uniting with the fibers of the mylo-hyoid. No similar case is on record. ═══ In a case in which the digastric consisted, as usual, of two portions, the anterior of these was attached to the lower border of the inferior maxilla, between the insertion of the masseter and the origin of the depressor anguli oris. From the same point arose an accessory bundle of fibers, which passed inward and downward to be inserted into the tendon of the mylo-hyoid. Such an origin of the digastric, although common in the lower animals, has been observed in man in only two other cases.

80. Record is here made of several *anomalies of the deep anterior muscles of the neck*—first, of six cases in which an atlantico-basilaris muscle was found, extending from the anterior tubercle of the atlas to the basilar portion of the occipital bone. This anomaly, which was bilateral in only one instance, occurred in four per cent. of the cases examined. Gruber says that, while the recti laterales and anteriores are to be considered as inter-transverse muscles, the atlantico-basilaris is a true anterior inter-spinous [this term seems to us an unfortunate one] muscle, being opposed both in relation and in function to the recti posteriores, or posterior inter-spinous muscles. In two cases an epistropheo[axo]-basilaris muscle was found extending from its origin in the superficial anterior atlo-axoid ligament to its insertion in the basilar process of the occipital bone. Other muscular anomalies in this region include five cases in which the longus colli muscle had a bundle of fibers attached to the basilar process; one case in which the rectus anticus major of one side was connected with the origin of the atlantico-basilaris of the other; one case in which the longus colli was connected with the epistropheo-basilaris at the opposite side; and a very curious instance in which the recti antici majores of the two sides were connected by a transverse bundle of fibers.

81. A case, hitherto unparalleled, of *a double-headed vastus externus muscle.* The external head arose from the linea aspera and the external surface of the femur, and passed forward to form the superficial layer of the muscle; the internal head, which was separated from the other at its origin by a distinct interval, arose from the anterior intertrochanteric line and from the anterior surface of the femur, and passed downward to form the deep layer of the muscle.

82. In one case Gruber found *a double occipital artery.* One similar instance is on record.

83. In one of Gruber's specimens, while the spermatic arteries arose from the aorta at the usual site, there was *an accessory spermatic artery* on the right side, which sprang from the common iliac. This additional branch supplied not only the testicle, but also its envelopes, and so replaced the external spermatic [cremasteric], which was wanting on that side. Many variations in the origin of the spermatic are enumerated, although in none was just this combination present.

84. The author has examined nine subjects in which there was *a double superior vena cava.* Of these, two occurred in young embryos, four at full term or after birth, and three in adult life. A short account is given of the peculiarities in each instance. In the case last observed there were a communicating branch between the two vessels in the thorax, and an azygos vein upon each side, that upon the left being provided with a valve at its entrance into the cava.

85. *A transference of the superior vena cava to the left side* is here noted. With this was associated a reversal of the ordinary relations, so that the right innominate vein behaved upon the right side exactly as the left innominate ordinarily does upon the left, and *vice versa.* The azygos veins were also reversed, the two lesser occupying the right side of the body, and the greater being present on the left side. Only two instances of this anomalous situation of the superior cava have been described.

86. In three cases of *anomalous course of the left innominate vein* observed by Gruber, and one by Cooper, the vein ran in front of and in close connection with the thymus gland.

87. *Apparent prolongation of the common iliac veins* to the first lumbar vertebra has been observed in seventeen cases. In seven of these, including the one here described, a transverse communicating branch existed between the two veins at about the point where they normally unite to form the inferior vena cava. In all cases this arrangement is to be attributed to an arrest of development, and the upper portions of the two iliac veins are to be regarded as ununited halves of a rudimentary vena cava, and not as a proper prolongation of the iliac veins upward. The communicating branch is in reality the right portion of the left common iliac.

88. Systematic examination of one hundred cadavera led Gruber to the following conclusions in regard to *anomalies of the peroneal* [external popliteal] *nerve and its branch, the superficial peroneal* [musculo-cutaneous]: Splitting of the peroneal nerve may occur so as to include one long insular tract (one half per cent. of cases), one short insular tract (in seven per cent.), or several short insular tracts (one per cent.); in one case the anterior tibial and the musculo-cutaneous together supplied only the first and second digital interspaces on the back of the foot; in three subjects the articular branch to the ankle joint was given off from the peroneal nerve at an unusually high point.

89. Gruber records three cases of *accessory pulmonary lobes* as coming under his own observation: two cases of division of the right lung into four lobes, and one of division into five. In each, the accessory lobe was situated at the apex, and was formed by the presence of a vertical furrow, in which was lodged the greater azygos vein. In each of the cases also the azygos vein opened directly into the superior cava. The fifth lobe, in the single case referred to, was produced by a crucial division instead of a simple bifurcation of the great fissure of the lung. In the particular description which he gives of one of the quadrilobed lungs, he says the supernumerary lobe received a separate division of the bronchus, of the pulmonary artery, and of the pulmonary vein.

Miscellany.

PATHOLOGICAL NOTES.*

Scrofula and Tuberculosis.—M. Grancher ("Union Médicale," May 14, 15, 26, 28, 1881) holds that scrofula and tuberculosis belong to one and the same family and species, the so-called scrofuloderm being regarded by him as an embryonic neoplasm, a tubercle which is localized, and relatively easy to cure, while if this same tubercle becomes fully developed we have tuberculosis. The name scrofula he therefore retains as a clinical convenience to designate the milder stage of tuberculosis in which treatment tends to result in cure. He thinks that the giant cell itself is not specially pathognomonic of tuberculosis, but rather the general arrangement of the cells. The development of the tubercle consists of several stages: first, one of infiltration of the embryonic cells into the tissues; second, a grouping of the cells, the nodulary stage; after which follows the stage of degeneration. The development may pass through these stages more or less rapidly, or the process may be arrested at the first step. He believes that lupus, chronic adenitis, chronic cutaneous or mucous inflammation, such as rebellious conjunctivitis, nasal ulcerations, cold abscesses, etc., should all be referred to tuberculosis, and not to scrofula. In support of his theory he enters largely into the study of the pathological anatomy of tubercle.

Ecchymoses in Locomotor Ataxia.—M. Straus ("Archives de Neurologie," Apr., 1881) draws attention to a symptom in locomotor ataxia which he names tabetic ecchymoses following the paroxysms of fulgurant pains in this disease. The ecchymoses appear upon the skin of the members attacked at a time coinciding with that of the subsidence of the pain, and at first are more or less dark red. They then pass through various shades of color, during the first few hours attaining a greenish-brown hue; and at the end of from four to six days the abnormal pigmentation has entirely disappeared. Throughout their entire course the spots are entirely devoid of pain. In shape they are circular, in size and number they are variable. Their extent and coloration are generally proportionate to the violence of the paroxysms. The author at first thought them to be accidental, but, finding them quite constantly, he came to regard them as one of the manifestations of the disease, and declares their occurrence very common. He believes them to be analogous to those hæmorrhages from mucous membranes which sometimes occur during the visceral spasms of locomotor ataxia, as, for instance, those of the stomach.

Endarteritis.—M. Martin ("Revue de Médecine," May, 1881) draws the following conclusions from his researches on the nature and the pathogenesis of the visceral lesions consecutive to obliterating and progressive endarteritis: 1. The tunica intima of the greater number of the arterioles of the body is exposed, during almost the whole of life, to those causes of irritation which inflame and thicken it, and cause, consecutively, a diminution in caliber proportionate to the quantity of blood in circulation. 2. This endarteritis appears in the first years of life, and localizes itself in young children in certain vessels which nourish the first portion of the aorta. At a later period it invades a great number of arterioles, but localizes itself by preference in the organs whose circulation and function are the most active. 3. The progressive diminution in the supply of nutritive materials to such viscera causes simultaneously an atrophy of the organic and functional elements and the proportional development of connective tissues. This sclerosis begins at a point farthest removed from the diseased arterioles, where the nutrition is the most insufficient; it is not preceded by capillary lesions; the functional cells in the vicinity appear healthy, uninflamed, during the initial period, and up to the time when the sclerotic tissue has become notably developed. 4. Endarteritis may be evolved acutely in certain infectious diseases (diphtheria, typhoid fever), giving rise rapidly to circulatory troubles which may of themselves cause death if the organ so affected performs an important function. 5. The irritant particles which circulate in the blood in certain individuals (alcohol drinkers, workers in lead, gouty people) exaggerate and hasten the development of chronic progressive endarteritis, etc.

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* Laid over from Dr. Katzenbach's Quarterly Report, published in the September number.—Editor.

THERAPEUTICAL NOTES.

Opium.—M. Bouchardat (quoted in "Union Médicale," Jan. 9, 1881) recommends opium in the treatment of acid dyspepsia, according to the following formula: Mix 75 grains, each, of powdered chalk and powdered rhubarb, and 1·4 grains of powdered crude opium; divide into ten powders; one to be taken daily, at the beginning of the principal meal. Acid and over-seasoned food should be avoided. For fœtid eructations, the use of nitrogenous food should be restricted, and charcoal should be given, with small doses of subnitrate of bismuth. ===== Mr. E. B. Shuttleworth states, in a paper read before the Toronto Medical Society ("Canadian Pharmaceutical Journal," Feb., 1881; quoted in "American Journal of Pharmacy," Mar., 1881), that one grain of dry opium is contained in 15 minims of tinctura opii (Br. Ph.); in 11 minims of extractum opii liquidum (Br. Ph.); in 11 minims of Battley's liquor opii sedativus; in from 4 to 8 minims of a so-called liquor opii sedativus largely used in Toronto; in 13 minims of tinctura opii deodorata (U. S. Ph.); and in about 18 minims of various fluid extracts. The deodorized tincture of the U. S. Pharmacopœia is as good a preparation as Battley's liquor opii sedativus, but the process of preparing it is expensive. An equally good one may be made by concentrating an aqueous solution of opium by boiling, and redissolving the resulting extract. Such, he remarks, is the liquid extract of the British Pharmacopœia, but, in order to effect a more thorough separation of narcotina, meconin, meconic acid, and resinous, odorous, and extractive matters, he recommends that the process be repeated several times, and that the resulting liquor be assayed for morphia, and brought finally to such a measure that it shall show a morphia strength of 3 grains to the ounce, a small portion of spirit being added to preserve it from mold and deterioration by age. ===== M. Hanot (quoted in "Union Médicale," Jan. 23, 1881) recommends hypodermic injections of morphine in the epigastric region for the vomiting of phthisical patients, or the application of a flying blister to the same part. ===== Professor Peter (*ibid.*) meets the same condition by giving a drop of laudanum, in a teaspoonful of water, before each meal, so as to soothe the mucous membrane of the stomach without giving rise to any effect upon the system at large. ===== M. Dreyfus-Brisac ("Gazette Hebdomadaire," Jan. 7, 1881) urges that morphia is the best remedy for dyspnœa, no matter what its cause may be, whether pulmonary or cardiac. The only contra-indications are cerebral congestion and a state of lowered vitality, also the intolerance peculiar to young children. ===== A reviewer ("Dublin Journal of Medical Science," Mar., 1881), speaking of acute cold in the head, says: "We ourselves suffered much from this annoying complaint, and completely got over liability to it by means of a powder consisting of gr. 3 of acetate of morphia, well rubbed with ʒ ss., each, of white bismuth and pulv. tragacanth. When the sneezing, the well-known harbinger of the coryza, comes on, this powder should be used as snuff in both nostrils until the bitter flavor is felt in the back of the pharynx. As often as the sneezing recurs it should again be employed, and after a few applications—often after a single one—the cure will be found complete." ===== For sea-sickness M. Velasco ("Journal de Médecine de l'Algérie"; "Gazette des Hôpitaux," May 3, 1879; "Bulletin Général de Thérapeutique," Feb. 15, 1881) recommends [? hypodermic] injections of 0·005 to 0·01, or even 0·02 gramme [$\frac{1}{13}$, $\frac{1}{6}$, and $\frac{1}{3}$ grain] of morphine. ===== Dr. W. Easby ("British Medical Journal," May 28, 1881) recommends the addition of about 10 drops of pure carbolic acid to each fluidounce of solution of acetate of morphia for hypodermic use, to prevent decomposition. It keeps for some time, and its use does not cause smarting. He finds, however, that the tartrate of morphia, which dissolves in cold distilled water, will keep for almost any length of time without any addition. ===== Budberg ("Correspondenzblatt für schweiz. Aerzte"; "Medicinisch-chirurg. Rundschau," 1880; "Memorabilien," xxvi, 2, 1881) recommends codeine in preference to morphine when only a mild narcotic is needed, especially for persons who suffer from nausea after the use of morphine; $\frac{1}{6}$ grain of the hydrochlorate is usually a sufficient dose. It is not so apt to cause itching as morphine is; it does not disturb the digestive tract, except that large doses may give rise to slight constipation; and it has no particular effect on the urinary apparatus. ===== Contrary to the opinion of Bernard, M. Jules Simon ("Tribune Médicale," Mar. 13, 1881) regards codeine as less poisonous than morphine, at least in children. The three opiates that answer best for children are paregoric, syrup of codeine, and Sydenham's laudanum. ===== M. Larmande (quoted in "Union Médicale," Feb. 26, 1881) treats the sleeplessness and headache of influenza with the following mixture: Hydrate of chloral, 23 grains; syrup of codeine, 1 fluidounce*; infusion of tilia, 3 fluidounces. One third is to be taken at once, and the remainder in teaspoonful doses every hour, continuing its use for three or four days, according to the effect produced. ===== M. Villemin (*ibid.*, Jan. 11, 1881) thus compares the indications for various hypnotics: Morphine, narceine, and codeine are all suitable for sleeplessness due to pain, but are contra-indicated by cerebral congestion; bromide of potassium answers in insomnia with an excited circulation and in nervous wakefulness, but is contra-indicated by very pronounced anæmia; chloroform, in the form of a draught, is particularly efficacious in nervous insomnia; hydrate of chloral is useful in almost all cases, except certain cardiac affections, and those accompanied by dyspnœa or by great debility; the insomnia of old people and of the anæmic is often overcome by tonic medication, wine, bitters, and hydrotherapeutics.

ITEMS.

A Singular Assault and Battery Suit.—An English housewife, being told that a servant girl in her employ had probably become pregnant illicitly, which charge the girl denied, sent for a physician to make an examination. To this the girl strenuously objected. The mistress, however, insisted upon it; and by her peremptory commands, supported by those of the physician, though without positive violence, the examination was made, the girl objecting throughout. She then brought an action of assault against her master and mistress, and the physician. But the decision was that no case was established. It was true that the mistress had no right to order the examination, and the girl might have resisted if she had chosen. But, in fact, she did not resist. The examination took place by her consent or submission, though unwillingly given. There was nothing to show that the physician used or threatened to use any force. If the girl supposed that force would be used, without, however, his giving her reasonable cause to think so, he would not be liable. To charge him with assault, it must be shown either that he used actual force, or that she acted under conduct of his which gave her reasonable cause to think that he would use force. If she submitted voluntarily, though unwillingly, there was no assault.

Compensation for Testifying as Expert.—According to the "Central Law Journal" for March 4th, a United States District Judge has refused to compel a physician called as an expert to testify until paid a reasonable compensation. He declared that a man's skill and professional experience were so far his individual capital and property that he could not be compelled to bestow them gratuitously; and the public had no more right than a private person to extort from him information or services in the line of his profession.

Army Intelligence.—*Official List of Changes of Stations and Duties of Officers of the Medical Department, United States Army, from August 14, 1881, to September 13, 1881.*—McKee, J. C., Major and Surgeon. By direction of the Secretary of War the leave of absence on Surgeon's Certificate of disability granted in S. O. No. 177, August 19, 1880, is extended three months. Par. 3, S. O. 189, A. G. O., August 18, 1881. ===== Byrne, Charles C., Major and Surgeon. Relieved from duty at Angel Island, California, and assigned to duty as Post Surgeon at Benicia Arsenal and Attending Surgeon at Benicia Barracks, California. S. O. 142, Military Division of the Pacific and Department of California, August 23, 1881. ===== McClellan, Ely, Major and Surgeon. Relieved from duty in the

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* Containing about 1½ grains of codeine.

Department of the Columbia, and to proceed to Louisville, Kentucky, and report by letter upon his arrival there to the Surgeon General. S. O. 193, A. G. O., August 23, 1881.

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Woodhull, A. A., Major and Surgeon. Relieved from duty in the Department of California, and to proceed to New York City, and report by letter upon his arrival there to the Surgeon General. S. O. 193, A. G. O., August 23, 1881.

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Brown, Harvey E., Major and Surgeon. Relieved from duty in the Department of Texas, and to proceed to New York City, and report by letter upon his arrival there to the Surgeon General. S. O. 192, A. G. O., August 22, 1881.

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Hubbard, V. B., Assistant Surgeon. Promoted to the rank of Major and Surgeon in the Medical Department, to take effect from the 10th of August, 1881, vice White, deceased.

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Hubbard, Van Buren, Major and Surgeon. The leave of absence granted him in S. O. 169, A. G. O., August 26, 1881, is extended eight months, with permission to go beyond sea. S. O. 193, A. G. O., August 23, 1881.

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Coues, Elliott, Captain and Assistant Surgeon. Granted leave of absence for one month, to take effect when relieved by a medical officer, with permission to apply for three months' extension. S. O. 97, Department of Arizona, August 22, 1881.

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Dickson, J. M., Captain and Assistant Surgeon. Relieved from duty in the Department of the Columbia, and to proceed to New York City, and report by letter upon arrival there to the Surgeon General. S. O. 193, A. G. O., August 23, 1881.

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King, William H., Captain and Assistant Surgeon. To accompany Battery "I," Third Battery, to Yorktown, Virginia, and remain with it until further orders. S. O. 153, Department of the East, August 31, 1881.

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Cowdrey, S. G., Captain and Assistant Surgeon. Relieved from duty in the Department of the Platte, and to proceed to New York City, and report by letter upon arrival there to the Surgeon General. S. O. 193, A. G. O., August 23, 1881.

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Adair, George W., Captain and Assistant Surgeon. Granted leave of absence for two months. S. O. 196, A. G. O., August 26, 1881.

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Gardner, E. F., Captain and Assistant Surgeon. Upon being relieved by Assistant Surgeon Bushnell, is relieved from duty in Department of Dakota, and will comply with par. 3, S. O. 171, A. G. O., S. O. 150, Department of Dakota, August 17, 1881.

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Shannon, W. C., Captain and Assistant Surgeon. Relieved from duty at Fort D. A. Russell, Wyoming, and assigned to duty as Post Surgeon at Fort Thornburgh (junction of White and Greene Rivers), Utah. S. O. 81, Department of the Platte, August 22, 1881.

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Robinson, Samuel Q., First Lieutenant and Assistant Surgeon. Relieved from duty in the Department of Dakota, and to proceed to Boston, Massachusetts, and report by letter upon arrival there to the Surgeon General. S.O. 193, A. G. O., August 23, 1881.

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Powell, J. L., First Lieutenant and Assistant Surgeon. Granted leave of absence for one month, to take effect as soon as the Medical Director of the Department shall have completed certain inspection duty at Fort Stockton, Texas. S. O. 99, Department of Texas, August 13, 1881.

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Strong, N., First Lieutenant and Assistant Surgeon. To proceed to Park City, Utah, report for temporary duty to commanding officer of the troops en route to Fort Thornburgh, Utah, and remain on such duty until arrival of Captain W. C. Shannon, Assistant Surgeon, U. S. Army. S. O. 84, Department of the Platte, August 29, 1881.

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Arthur, W. H., First Lieutenant and Assistant Surgeon. Granted leave of absence for one month, to take effect from the date of return of Surgeon Forwood to Fort Omaha. S. O. 82, Department of the Platte, August 24, 1881.

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Bushnell, G. E., First Lieutenant and Assistant Surgeon. Relieved from temporary duty at Fort A. Lincoln, Dakota Territory, to take effect on his arrival at that post, and to proceed to Fort Ellis, Montana Territory, and report to the commanding officer for duty at that post, to relieve Assistant Surgeon E. F. Gardner. S. O. 150, Department of Dakota, August 17, 1881.

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THE PHYSIOLOGICAL AND THERAPEUTICAL ACTION OF ERGOT.

By ETIENNE EVETZKY, M. D.

(Continued from October number.)

Action of Ergot on the Heart.—We know that ergot produces a decided effect on this organ, and this was noticed by the earliest observers. The pulse in acute ergotism may be at first accelerated, to be retarded toward the close. During chronic ergotism the pulse is always slow, and the same effect is produced when a moderate quantity of ergot is introduced into the system. According to Nikitine, sclerotic acid acts in this manner only on frogs; in the warm-blooded animals even large doses failed to produce this effect. Haudelin observed, first, acceleration of the pulse with subsequent retardation. Eberty,[*] by injecting 0·1 gramme of ergotine into the gastric vein of a frog, reduced the pulsations from 30 to 6 a minute, and the second dose arrested the heart-beats completely. But in warm-blooded animals the pulse rate seldom falls below 60, although Hooker[†] reported an experiment on a medical student, who took two drachms and a half of oil of ergot with the effect of diminishing the frequency of the pulse from 82 to 36. According to Gibbon,* the maximum effect is usually observed in a half-hour after the exhibition of ergot, and the effect may last, according to Hooker, for a number of days. The reduction of the pulse rate is always greater if the heart's action is excessive, and the sedative influence of ergot on the circulation is to be seen under the most favorable conditions during a febrile state.

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[*] Virchow and Hirsch, "Jahresbericht," 1873.

[†] Stillé, "Therapeutics and Materia Medica," ii, p. 585.

Not only the frequency of the pulse is affected, but the heart's contractions also become weak and irregular. Should a toxic dose be given, the heart stops in diastole; and then no stimulant—mechanical, electrical, or chemical—can make the organ respond. Ergot acts mainly on the ventricles; the auricles apparently escape almost entirely. Rossbach † and Wernich state that if the heart be carefully watched it is noticed that the ventricles contract once to every two contractions of the auricles, and that the latter do not show any change from the normal type, while the ventricular diastole is incomplete, and the contraction of the separate fibers is not simultaneous, but alternating, giving the appearance of peristalsis and also as if certain fibers were persistently contracted while other, were relaxed.

There is some evidence that ergot exerts on the heart the same effect as on the other organs composed of organic muscular tissue, namely, reducing its size by contracting and condensing its fibers. Of course, this effect can not be very marked in a state of health any more than in other cases, but, when there exists an unnatural relation of the organ, its action is prompt and decided. Willebrand ‡ noticed the diminution of the healthy organ. The same effect was also observed in frogs. This subject will be more fully treated when we speak of the use of ergot in cardiac affections.

It remains now to make an effort at determining in what manner ergot produces these effects on the heart. They can not be due to ergot paralyzing the cardiac muscle, as all the earliest observers thought, and as Rossbach has more recently affirmed. If we give ergot to an animal which is completely atropinized, we find that it fails to affect the heart even when used in very large doses. From this we infer that between these two drugs there exists a very striking antagonism in their action on the heart. Atropine, as the reader knows, paralyzes the cardiac inhibitory centers, which we conclude from the acceleration of the pulse, and from the fats that in the atropinized animal both section and irritation of the pneumogastric nerves fail to produce their usual effects. Ergot, on the other hand, retards the pulse, and when the cardiac inhibitory centers are paralyzed by atropine it fails to act, showing that it acts on the heart by stimulating these centers. When it induces the arrest of the heart, this occurs in the diastole, the organ being relaxed and flabby—a picture identical with that of the arrest of the heart by a strong irritation of the cardiac inhibitory centers through the medium of the pneumogastric nerves. That ergot acts on these centers directly, and not on the medullary centers of the vagi, we conclude from the fact that ergot produces also the same effect on the heart after they have been destroyed. Such a decided action of ergot on one part of the cardiac innervation suggests, naturally, the thought of the probability of other parts of it being affected by it also. This is not apparent in the usual experiments on animals, but clinical evidence speaks in favor of ergot acting on the cardiac excito-motor centers as a stimulant. Eberty, Boreidscha,* Köhler, and others think that ergot affects the cardiac centers directly, while Wernich is inclined to ascribe the results to their irritation by the diminished blood-supply of the organ.

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* "Am. Jour. of the Med. Sci.," Jan., 1844.

† Virchow and H'rsch, "Jahresbericht," 1874.

‡ Dybkowsky, *ibid.*, p. 612.

Action of Ergot on the Blood-vessels.—Some modern observers deny entirely any active contraction of the arteries resulting from the use of ergot. Boreidscha is led by the results of his experiments to the conclusion that there exists a marked similarity between the action of ergot and that of nitrite of amyl on the vasomotor centers. The difference, according to him, consists in ergot acting mainly on the splanchnic nerves, while nitrite of amyl acts chiefly on the cervical sympathetic. He asserts that ergot can produce a further lowering of the blood pressure after nitrite of amyl has accomplished its full effect. The arrest of hæmorrhage with ergot is explained as a secondary result of the diminution of the heart's action and of the lowered blood pressure, permitting the elasticity of the blood-vessels to have full play. Zweifel † explains the contraction of the capillaries in cases of hypodermic injection or local application of ergot as a simple reflex phenomenon due to the action of an irritating and painful agent, as similar results follow the use of a great many irritating substances, having no direct relation to the circulation. If the animal be narcotized, and consequently the painful reflexes abolished, he states that the use of ergot fails to induce the contractions of the blood-vessels. Should this occur, the effect is but slightly marked and of brief duration, being rapidly followed by the dilatation.

These are the only observers who do not share the generally accepted opinion that ergot produces an active contraction of the vessels. The idea itself is a very old one. Courhant, as early as 1827, advanced this theory. It was adopted by Sée in 1842, and supported by Sovet in 1848. Later on Klebs [*] proved experimentally that ergot produced anæmia and a rise of blood pressure. And, although this view was fully established by clinical experience, not until 1869 was the contraction of blood-vessels actually observed under the microscope, by Briesemann.[†] This was confirmed by Holmes [‡] in 1871, who drew with the camera lucida the appearances of the blood-vessels before and after the exhibition of ergot, and also by all subsequent investigators—Patel,[#] Wernich, Niccol and Missop,[‖] Eberty, Brown-Séquard,[ᐞ] Kersh,[◊] Köhler, Peton,[↧] and others. But the actual mode of production of this contraction of the blood-vessels is more difficult to demonstrate. The same question arises here also, Is it due to the action of ergot on the vaso-motor centers (cerebro-spinal and peripheral), or is it due to the direct action of ergot on the contractile cells of the blood-vessels? The cerebro-spinal influence is placed beyond doubt. All observers agree on this point. There is also sufficient evidence of the fact that ergot acts on the blood-vessels when the part is separated entirely from the cerebro-spinal axis and the sympathetic system. Holmes observed contraction of the blood-vessels after he had severed all their vaso-motor nerves. Peton noticed an immediate effect when ergot was injected into the observed part, but if all the nerves leading to it were cut, and the injection made at a distant point, the contraction occurred also, but was delayed. Wernich and Köhler are also in favor of the peripheral action of ergot.

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* "Moskow. Pharmakol. Rabot.," 1876, p. 50.

† *Op cit*

Testimony to the opposite is not wanting. Voigt,[↕] Wood,[⇞] and Eberty failed to see the vascular contractions after the separation of the vaso-motor nerves; they admit them to be possible only on condition of intact vaso-motor nerves. Independent of the experimental evidence in favor of the peripheral action of ergot, we have also abundant clinical facts to the same effect. Local applications of ergot contract the blood-vessels, and this occurs when ergot is used in quantities making it impossible to advance the idea of its action through absorption, and so dilute as to exclude the idea of a reflex effect from irritation. With regard to the action of ergot on the veins, Wernich observed them dilate, while Patel and Köhler state that they are acted upon by ergot in the same manner as capillaries and arteries. This effect on the blood-vessels occurs only if the quantity of ergot is not great; if, on the contrary, the dose is toxic, instead of the contraction we have a complete paralysis, giving rise to the venous congestion so constantly seen in animals and men poisoned with ergot.

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[*] Virchow's "Archiv," xxxii, p. 490.

[†] Inaug. Diss., 1870.

[‡] "Arch. de Physiol.," etc., 1870, p. 384.

[#] Inaug. Diss., 1871.

[‖] "Brit. and Foreign Med.-Chir. Rev.," l, p. 200.

[ᐞ] "Arch. de Physiol.," 1870, p. 484.

[◊] "Memorabilien," v, p. 200.

[↧] Thèse de Paris, 1878.

[↕] "Berl. klin. Woch.," 1869, No. 12.

[⇞] "Phila. Med. Times," 1874, p. 519.

As in the case of the heart, we are led to conclude that ergot acts on the blood-vessels through their nerve supply, and not upon their muscular structure. The greatest effect is due to the irritation of the vaso-motor centers in the medulla oblongata and the spinal cord. The peripheral action is readily explained by the existence of a rich ganglionic network in and about the blood-vessels, which is acted upon by ergot in the same manner as the medullary vaso-motor centers.

Action of Ergot on the Blood Pressure.—The state of the blood pressure is determined by the conjoined action of the cardiac contractions and the lumen of the blood-vessels. The greater or less is the vigor of the cardiac action, the greater or smaller is the caliber of the blood-vessels, the greater or less will be the blood pressure. But ergot acts in the two opposite directions—by reducing the energy of the heart it tends to lower the arterial tension; on the other hand, by contracting the blood-vessels it will operate in the contrary manner. In large toxic doses, by paralyzing the heart and the vascular tonus, it will effect a marked fall of the blood pressure. It is evident, then, that we can not expect to obtain uniform results with regard to the vascular tension, as they differ not only according to the amount of ergot used, but also according to the peculiar conditions of the circulatory organs present. Drasche,* using the therapeutic doses on healthy men, obtained a rise of the blood pressure, a conclusion based upon the study of the characters of the pulse and of the sphygmographic tracings. Holmes, Klebs, Eberty, Köhler, and others observed in animals an increase of the tension; and Handelin, Hermann, Wernich, and Boreidscha arrived at the opposite conclusion. These contradictory statements are such only in appearance, as they relate to the different stages of the physiological action of ergot on the circulation. The first effect of ergot is to increase the blood pressure, but if the quantity of ergot used be excessive, the period of the increased tension may be very brief, and even be entirely wanting, on account of the rapidly developing vascular paralysis. If a moderate or small amount of ergot be introduced, the period of increased tension will be more marked, and the secondary reaction may be absent. In man the circulatory apparatus may present conditions in which even ordinary therapeutic doses will produce a well-defined sedative effect on the circulation entirely disconnected from the paralysis of the heart or of the vaso-motor centers. This occurs if ergot is given to persons whose heart is in an abnormal state of activity, as in fevers, inflammations, cardiac hypertrophy, palpitation, etc. I will refer the reader to the description of the action of ergot in aneurisms, where the sedative action of ergot on blood pressure is particularly well marked.

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* "Wien. med. Woch.," 1872, 38, 40.

Action of Ergot on the Organs composed of the Organic Muscular Tissue.—The stomach, intestines, uterus, and bladder are identical in their structure and mode of innervation with the heart and the blood-vessels, and consequently we should expect to find the same effects on them from ergot.

Intestines.—Wright, on opening the peritoneal cavity of animals poisoned by ergot, observed an active peristalsis. A similar effect was noticed by Wernich on animals during life and with the peritoneal covering intact. Haudelin and Peton observed the same. According to Nikitine, sclerotic acid always produces an active peristalsis in warm-blooded animals. Diarrhœa is a very common symptom in patients suffering from chronic ergotism (it was present in seventy per cent. of patients during the epidemic described by Swjatlowsky), while vomiting is of less frequent occurrence. This would justify us in the belief that we have to deal in these cases with diarrhœa produced not only by the irritation of the intestinal mucous membrane, but also, at least in part, by the action of ergot on the motor centers of the intestinal muscular tissue. At times, on the contrary, the patients suffer from constipation, apparently due to the tonic spasm of the coats of the intestines. Unfortunately, we possess no facts to determine the exact mode of action of ergot on the innervation of the intestines. I have failed to find any experiments relating to the action of ergot on the stomach.

Bladder.—In animals poisoned with ergot, the bladder may be found distended with the urine, or empty and firmly contracted. In the first instance we have a spasmodic contraction of the vesical sphincter in the foreground, while in the latter the entire muscular structure of the organ is under the influence of ergot. The experiments of Peton are more thorough than those of any other observer. He noticed soon after an injection of ergot the appearance of fibrillary contractions resulting in the complete evacuation of the organ; in other cases the contractions alone were seen. Wernich observed the same phenomena, and he recommends close attention to the regularity of micturition in patients treated with ergot, and, should retention occur, the use of the catheter.

Uterus.—The action of ergot on the uterus constituted at one time the most prominent feature in the entire range of our knowledge of its physiological properties. That ergot can induce contraction of the pregnant uterus, resulting in the expulsion of its contents, is well known. The same effect is produced also on animals fed on food mixed with ergot. It is also well established that the ergotic uterine contractions differ materially from the normal parturient type, being of longer duration, assuming the character of a spasm, and frequently manifesting themselves chiefly at the lower segment of the uterus. It is also a well-known fact that the energy of the action of ergot is in proportion to the length of time the gestation has existed, and that it is the most intense during labor. That the uterine contractions thus induced may be very powerful we have abundant proofs. There are well-authenticated cases of various traumatic accidents to the organ and the fœtus, such as laceration of the uterus, crushing of the child's head,* and other injuries. More interesting are the action of ergot on the non-pregnant organ and the manner in which it is produced. The experiments of Wernich show that ergot induced fibrillary contractions of the muscular tissue of the uterus, and this was also noticed by Schlesinger. Nikitine found that sclerotic acid induced them in the normal organ, and that if they were present they were intensified by it. But the disputed question is, the manner of their production. According to Schlesinger and Oser, † who discovered the existence of the uterine motor centers in the cerebro-spinal axis, the uterine contractions are due to anæmic irritation of these centers; but Wernich believes they are due to the direct action of ergot on these centers, because the contractions occur some time after the appearance of the cerebro-spinal anæmia. He states also that, if the spinal cord be cut in the lumbar region, ergot fails to act on the uterus, and from this fact he concludes that the motor impulse is of cerebral and not of peripheral origin. The more recent observations of Boreidscha question the correctness of the latter statement. He noticed well-marked contractions of the uterus after all its nervous connections with the cerebro-spinal axis had been severed, showing that, at least in part, they were due to ergot acting on the motor centers within the uterine structure, the existence of which is admitted by all. The behavior of the uterus under ergot is, then, identical with that of the blood-vessels. The maximum effect in both cases is due to irritation of the cerebro-spinal centers, but it is possible also to demonstrate an active participation of the interstitial motor centers.

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* Veit, "Ztschr. f. Geburtsh. u. Gynäk.," iii, 2. † "Med. Jahrb.," 1872, 1873, 1874.

Action of Ergot on the Iris.—Alterations of the pupil belong to the most constant symptoms of ergotism. In acute poisoning, where we witness paralytic manifestations, the pupils are dilated. During the early stages of spasmodic ergotism, characterized by the irritative action of the drug, the pupils are contracted in a very marked degree. But toward the close of the chronic poisoning, with the appearance of the paretic and paralytic symptoms, the pupils present an uneven aspect, and at death they are dilated. The action of ergot on the iris resembles, then, very much that of the Calabar bean. According to Comperant and McEvers,* ergot may even counteract the effect of belladonna. In the absence of special investigations to determine the *modus operandi*, we must be satisfied with the conclusion that ergot excites at first the motor apparatus of the orbicular fibers of the iris and paralyzes it in toxic doses.

Action of Ergot on the Glands.—The activity of the glands is controlled by two kinds of nerves—vaso-motor and glandular proper. The first regulate the energy of the circulation in the blood-vessels surrounding the follicles and acini, the latter terminate in the glandular epithelium, and influence their nutritive processes, hastening or retarding the disintegration of the secreting cells, the secretion being the diluted product of this cellular dissolution. The action of ergot on secretion is very slight in health, and frequently not noticeable at all. We must turn our attention to the bedside for the purpose of estimating this point in the physiological properties of ergot. Its power of arresting or diminishing all kinds of hypersecretion is very marked, and if we bear in mind that in health its action in this respect is very slight or *nil*, and that the hypersecretion occurring in man as a morbid condition, or produced artificially in animals by irritating the vaso-dilating nerves, is chiefly an exaggerated transudation, and not the normal secretion increased in quantity, we may readily conclude that ergot, in diminishing the excessive flow of a secretion, accomplishes this result by inducing anæmia of the glands, and not by affecting the secretory nerves. Still the latter may be acted upon also, only we have no means of ascertaining the fact. The function of the nerves is very easily suppressed or excited; minute doses of atropine, pilocarpine, opium, and some other substances readily depress or exaggerate the energy of the glands. The first-named substances act on the glandular nerves, but we are ignorant as to the mode of action of others, like sulphuric acid, oxide of zinc, preparations of lead, tannic acid, etc. Ergot, being a very decided nervine, may also act on the glandular innervation, and, if this is the case, the action is most likely of a sedative, paralyzing nature.

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* "Bull. Gén. de Thérap.," xxxvi, 1849, p. 41.

All observers agree that ergot induces profuse *salivation*. The cause of this lies partly in its acrid taste, and partly in the irritation of the alimentary canal. *Digestion* is invariably disordered if ergot is used for a long time, in consequence of gastro-enteritis and circulatory disturbances in the adjacent glands diminishing the secretion of the digestive fluids. Haudelin did not find any material change in *lachrymation* or *defecation* in the animals experimented upon in the usual manner. The secretion of *urine* is not affected by ergot in a sensible manner (Haudelin, Drasche, Peton, and others), but these experiments are rather difficult to carry on, on account of the disturbances in the function of the bladder. *Perspiration* and the secretion of *milk* are not affected by ergot in a state of health to any appreciable extent, but all these three secretions are materially modified if morbidly increased. The same is applicable also to the *mucous* secretions. We have no positive data with regard to the secretions of the *liver*, the *pancreas*, and the remaining glands. The *spleen* is diminished in size, but the effect is not marked on the healthy organ. Ergot may at times cause *seminal emissions* by irritating the sexual centers of the lumbar spine.

Action of Ergot on the Temperature.—In nearly all accounts of epidemics of ergotism, coldness of the skin and a feeling of cold are mentioned as prominent features. In the recent epidemics of ergotism in Russia, described by Swjatlowsky, he noticed elevated as well as lowered temperature. Out of thirty-five cases, nineteen of which were severe, in only three patients did he observe the axillary temperature below the normal (95·6° F.), but the elevated temperature did not exceed 99·8°. According to Drasche, the therapeutic doses in healthy man produce a slight rise of temperature—0·1°. Large toxic doses always depress the temperature in a very striking manner. In this agree Köhler, Galippe and Baudin,* Nikitine, Kersh, and others. But of course the proper field to study the antipyretic properties of ergot is at the bedside, and we have some evidence that it possesses them to a marked extent. Still, this is yet an unexplored field. Hayem † found ergot to exert a more decided control over the temperature of typhoid fever than quinine or digitalis. Gillette * speaks highly of the action of ergot in rheumatic fever. The reader will see that in croupous pneumonia also ergot tends to lower the temperature. The same effect is noticed also in sunstroke, etc. But the rise of temperature may be due to so great a variety of causes that the propriety of using the term antipyretic seems questionable, except in connection with hydrotherapeutics.

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* "Gaz. Méd. de Paris," 1878, p. 150.

† "Am. Jour. of the Med. Sci.," 1876, i, p. 56.

Action of Ergot on Respiration.—Dyspnœa is a very common symptom of ergotism. Swjatlowsky noticed in all cases reduced frequency of respiration (14–16), and this was more marked in children. Experiments on animals give the same result, and Nikitine lays particular stress on the depressing action of ergot on respiration. According to him, toxic doses of ergot stop the respiration previous to the arrest of the heart's action, so that death is due to asphyxia and not to cardiac paralysis. Previous to the arrest of the respiratory movements they may be very much accelerated. Drasche did not notice any effect from therapeutic doses. Dyspnœa, if it is due to the action of ergot on the nervous system, must be ascribed either to irritation of the laryngeal branches, or to paresis of the pulmonary branches of the pneumogastric nerves.

Action of Ergot on Nutrition.—We do not possess any facts relating to the influence of ergot on nutritive exchange (*Stoffwechsel*). From our knowledge of the physiological properties of ergot, we may infer that it can not be great. Ergot differs in this respect from iron, alkalies, and other substances having a direct bearing on the chemistry of the system. The grave nutritive lesions peculiar to chronic ergotism are caused, like the other manifestations of ergotism, by its action on the trophic centers of the spinal cord. It would be out of place to review the disputed question of the existence of these centers. It will suffice to say that the negative assertion is based upon experiments in physiological laboratories, the least competent method of approaching the subject, as we have no means of reaching, modifying, or suspending the function of these centers in a direct manner without producing at the same time grave complications, entirely obscuring the operation of the forces in question. The method of severing the nervous connections of a part from its nerve centers is open to the same objections; and, what is more, entirely different conditions are created, because in disease the nervous connections are intact; only the function of the centers is modified. Those who advocate the existence of trophic centers base their assertion on clinical observations, claiming properly that the single vaso-motor disturbances are not competent alone to produce the various local nutritive disturbances observed so frequently in the course of a great many diseases, or constituting the disease itself. The latter view is rapidly gaining favor with pathologists, and the drift of the present evidence is decidedly for the existence of centers having a direct control of local nutrition. It is yet premature to determine in what manner this function is exercised, or what are the anatomical characteristics of these centers; we know fully as little of a great many other topics having a legitimate place in science. Ergot attacks the nutritive centers of the skin in preference to others, but its action may have a much wider range—those of the joints, blood-vessels, internal viscera, etc., may also be affected. The ultimate result of this action is impaired vitality of the part, terminating in its destruction and gangrene, or in the occurrence of suppuration, low forms of inflammation, tubercle, etc. With regard to the general nutrition, it is apt to suffer from the prolonged use of ergot. This is caused partially by the disturbed state of the alimentary canal, and also by the injurious action of the drug on the nervous tissue.

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* "Rev. de Thérap. Méd.-Chir.," 1874, p. 455.

Effects of Ergot on the Fœtus.—At present ergot is used very seldom in the early stages of labor, and opportunities of witnessing its ill effects on the child are rare. In former times this practice was very common, bringing opprobrium on the drug. Unquestionably it was the cause of a great many still-births, but it has been also held responsible for the unfavorable course of parturition when this was due to some other conditions. As has already been stated, the use of ergot was interdicted in France in 1774. It was readmitted at a later period; still, the indiscriminate and frequently injurious use of it induced the Prefect of the city of Paris to send to the Academy of Medicine in 1855 a communication, in which he called the attention of the faculty to the increasing rate of still-births, which he ascribed to ergot, and inquiring about the propriety of restricting by legal regulations the use of ergot in obstetric practice, if not entirely prohibiting it. During the discussion of this subject, St. Claire Deville * brought to light some very damaging facts if we admit them to be due to the use of ergot. He found that the rate of still-births in Paris in 1829 was only five per cent. of the entire number of births; in 1839 this figure rose to nine per cent., and in 1855 to eleven per cent. The child is affected by ergot in a number of ways. The placental circulation is interfered with; after the rupture of the membranes powerful and spasmodic contractions of the uterus compress the umbilical cord and prevent the free flow of

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* "Lancet," June 18, 1859.

blood through it; they may lead even to traumatic injuries to the child. If ergot is given early in labor, the normal type of uterine contractions is perverted, retarding the completion of the act, and jeopardizing the life of the child. These considerations refer only to the action of ergot on the child during parturition, and from the mechanical stand-point. The question, if ergot has any constitutional effect on the child when taken by the mother, is difficult to answer. Hardy* states that he has observed retardation of the fœtal heart beats. It is well known that remedies pass from the mother to the child, and act on the latter in their peculiar manner.† There is no reason to think that the same does not occur with ergot. Still, it is established that ergotized mother's milk has no injurious effect on the child.

Systemic Effect of Therapeutic Doses of Ergot.—Prolonged administration of ergot may affect the patient injuriously. First to suffer is the alimentary canal, when the drug is taken by the mouth. If introduced by hypodermic injection or by the rectum, the digestion is spared, and we must watch for the injurious results in the direction of the nervous system. In some patients a train of symptoms resembling a mild form of spasmodic ergotism is very rapidly developed; in others, the drug is borne still worse—something like an acute ergotism develops from a few small doses. In women we are apt to see very painful uterine colic. In other patients ergot may produce angina pectoris, retention of urine, etc. But, as a rule, patients bear ergot very well, and very little is noticed beyond the action of the drug in regard to the special symptoms for which it was prescribed. We meet with reports of patients taking very large doses of ergot during a long period without suffering from it.‡ One of the most constant manifestations of therapeutic doses is its sedative action on the heart.

Condition of Ergot in the System, and its Elimination.—Ergot is absorbed into the circulation unchanged, and acts on the system as such. We can not say if it suffers any changes subsequently, or in what form and by what channels it is eliminated. Only in one case, that of Neubert, the effort was made to discover its presence in the system. After the tissues had been treated with alcohol, and the latter evaporated, a substance was obtained closely resembling Wiggers's ergotine. Wright was able to extract from the blood of animals poisoned with large quantities of ergot an oily matter, becoming black on heating, and evolving the odor of an old tobacco-pipe, apparently oil of ergot. It is well established that ergot does not pass into the milk. I have found only a single instance in which ergot was discovered in the excretions. A woman suffering from a uterine fibroid tumor was placed on the use of ergot; in the discharge from the womb was discovered a substance answering to the usual test for ergot.*

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* Wood and Bache, "United States Dispensatory," Phila., 1875, p. 383.

† Kubassoff, "Inaug. Diss.," St. Petersburg, 1880.

‡ Drysdale, "New Remedies," 1876, p. 15.

Relation of Ergot to Other Medicinal Agents.—We may infer from the preceding pages that ergot occupies a very distinct place in the materia medica, although resembling a number of substances to a greater or less extent. On the other hand, it possesses properties entitling it to be regarded as a physiological antagonist to a group of agents. *Strychnine* acts on the system in a manner most nearly allied to that of ergot. Both act similarly upon the motor centers of the spinal cord, the cardiac inhibitory, the vaso-motor, and all other motor centers of the organic muscular tissue. Therapeutically, it is simply a question of habit in some cases which of the two drugs shall be prescribed. But the main feature of strychnine is its action on the spinal motor centers of the voluntary muscular tissue, which are affected by ergot to a much lesser degree. *Digitalis*, like ergot, acts on the cardiac inhibitory and motor centers and the other motor centers of the organic muscular tissue; it also depresses the temperature. But its predominant stimulating action on the heart distinguishes it essentially from ergot as a therapeutic agent. *Quinine* possesses also in a mild degree a stimulating action on the organic motor centers; in large doses it paralyzes the vaso-motor and cardiac centers; it depresses the temperature. *Calabar bean* resembles ergot in many respects. Both contract the pupil, irritate the cardiac inhibitory centers, retard the respiration, raise the arterial pressure, and increase the intestinal peristalsis. The main difference between them consists in an early occurrence of the paretic state of the voluntary motor apparatus, even after doses of the Calabar bean not entirely toxic. We may, then, form an arbitrary group of the excito-motors of the organic muscular tissue, the typical representative of which will unquestionably be ergot. As antagonists to ergot, nitrite of amyl and atropine may be mentioned. *Nitrite of amyl* paralyzes the walls of the blood-vessels, and acts as a depressor to the motor cells of the spinal cord. *Atropine* also paralyzes the motor centers of the organic muscular tissue. It stimulates the cardiac motor and respiratory centers, and produces rise of temperature.

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* "Brit. Med. Jour.," May 18, 1878.

(*To be continued.*)

THE CORPUSCULAR ELEMENTS OF THE BLOOD; THEIR ANATOMY AND PHYSIOLOGY, NORMAL AND PATHOLOGICAL.

By ALEXANDER DUANE, M. D.

(Continued from October number.)

SPECIAL DISEASES OF THE BLOOD.

PLETHORA.—True plethora is a condition of the blood in which the red corpuscles and their contained hæmoglobin are increased above the normal amount. Such a state may obviously result from either an increased formation or a diminished metamorphosis of the blood cells. The former is the efficient cause in *bon-vivants*, who habitually take a large amount of tissue-forming food; the latter in those of sluggish habits who exercise little, and also in those who become plethoric upon the arrest of a periodical hæmorrhage or other habitual drain upon the system (Flint). Individual predisposition seems to have a good deal to do with the production of this condition. The increase in the corpuscles and hæmoglobin, which constitutes the morbid anatomy of the affection, is never very marked. Indeed, from considerations already touched upon, it seems likely that a more important pathological feature is a simultaneous increase in the watery elements of the blood, by which the total volume, and consequently the intra-vascular pressure, are raised to a relatively high point. This increase in total volume is probably in great part accountable for the symptoms produced. These include such objective signs as habitual ruddy color of the surface, with strong, full pulsation in the heart and vessels, coupled with a subjective sense of well-being and of physical and mental vigor; associated with these are the symptoms of cerebral congestion—stupor, vertigo, headache, tinnitus aurium, etc. These symptoms, it may be noted, are quite similar to those of cardiac hypertrophy, and, in fact, it makes little difference, as far as the results are concerned, whether the nutrient fluid is supplied in greater quantity or at a faster rate to the tissues. The cerebral symptoms are nearly identical with those observed in cases of hydræmia with absolute diminution in the number of corpuscles; and this fact would seem to substantiate the view, which we have already expressed, that such symptoms depend rather upon alterations of pressure than upon disturbances of nutrition.

This similarity in symptoms between conditions so essentially different has not infrequently led to errors in diagnosis and treatment. Such was especially the case when venesection was in vogue, and many an unfortunate patient, whose blood was already poor enough in all essential constituents and rich only in water, was bled repeatedly under the notion that he was "plethoric," and his condition was thereby rendered so much the worse. It is now recognized that, although bleeding produces a temporary amelioration of the symptoms by withdrawing a certain quantity of water from the veins and so lessening the intra-vascular pressure, this loss is soon replaced by transudation, and the vessels become as full as before, while the unavoidable escape of corpuscles, which are not so readily replaced, has depreciated the quality of the blood and rendered it less fit for carrying on its functions. Venesection, therefore, is now employed only as a last resort to gain time, or in vigorous subjects who, having normally an excess of corpuscles in the blood, can afford to do with a smaller quantity. These latter cases of true plethora which are suitable for the operation may not always be distinguishable from the opposite class by physical appearance alone; and, since the diagnosis is of so much importance, it may be proper to confirm it by microscopic examination of the blood.

True plethora hardly amounts to a disease, and is unimportant except for the possible production of cerebral apoplexy. Its treatment is chiefly limited to fulfillment of the causal indication, which is effected by enjoining a radical change in the mode of life, with restricted diet and active exercise.

ANÆMIA.—The term anæmia has been loosely applied to a number of conditions associated with an imperfect performance of function by the red corpuscles of the blood. These conditions differ both in their pathology and in their causation. It is more convenient, however, to classify them upon the latter basis, since the significance of the pathological variations is as yet imperfectly understood. Accordingly, we may have a *symptomatic anæmia*, dependent upon mal-nutrition and occurring in the course of many diseases; a *toxic anæmia*, resulting from the action of some agent which impairs the function of the corpuscles while still circulating in the blood; a *traumatic anæmia*, due to escape of blood from the vessels; and a rare form, constituting a disease by itself, which from its relentless course and fatal termination is called *progressive pernicious anæmia*. These different varieties we shall consider in the order in which they are named, premising, however, that, while regarded as distinct affections, they present much that is common in respect to both symptoms and pathology.

Symptomatic Anæmia.—All diseases of nutrition, especially if of long standing, are accompanied by a depreciation in the number, quality, and function of the red corpuscles. In many cases also mal-nutrition may exist without the manifestation of any actual disease, and then this special symptom of anæmia assumes particular prominence, and demands consideration and treatment as if it were itself a morbid entity. As before remarked, anæmia may result from either deficient or diverted nutrition; in either case the supply of material out of which the blood cells are formed is diminished, and, in addition, the blood-forming organs share in the general depreciation of the system and become less active.

Such being the rationale of its induction, we may now fill in this general etiological outline by detailing the particular conditions which will produce these disturbances of nutrition. We must first remark, however, that the consideration of this subject has been much confused by the failure of different observers to distinguish between relative and absolute changes in the number of cells or in the amount of hæmoglobin. This is due to the fact that the means of diagnosis hitherto applicable suffice to determine only the ratio existing between the number of cells or the amount of hæmoglobin and the plasma of the blood. If, then, the proportion between plasma and cells remained the same, both of these constituents might be diminished in amount, and yet the hæmocytometer would not show that any anæmia existed; and, on the other hand, an apparent diminution of blood cells, as detected by this instrument, is quite compatible with the existence of an absolute increase in number. Hence, until we have some certain and readily applicable means of estimating the total quantity of blood in the body, our deductions as to the influence of disease upon the composition of the blood must be imperfect. It is doubtless on this account that the practical results obtained by different observers not only disagree with the anticipations of theory, but also differ widely from each other. Therefore, the statements we shall present on this subject, although representing as nearly as may be the most probable views, are not to be regarded as final or perfectly assured. With this proviso, we may go on to the consideration of the blood impoverishment caused by a deficient supply.

The first class of cases includes such as are caused by taking an insufficient quantity of food. This may occur in several ways: from absolute deprivation, as in the poor; from repugnance to food, as in the insane and some dyspeptics; from mechanical obstruction to the passage of food, as in cancer of the tongue and cancer, stricture, and diverticula of the œsophagus; and from the instantaneous rejection of food by vomiting, as may occur in pregnancy and other conditions. It is a curious fact that, although a partial inanition from any of these causes does produce a marked anæmia, total inanition from the absolute deprivation of food has *apparently* no effect.* We say apparently because this is undoubtedly one of the cases where our present methods of cytometric observation fail, because plasma and corpuscles vary in the same proportion. In the second place, anæmia very often results from the habitual use of food which is sufficient in quantity but improper in kind. This is really the same case as the preceding, since it obviously makes no difference, as far as nutrition is concerned, whether a portion of the food is withheld altogether or passes through the body without undergoing assimilation. A similar partial starvation obtains in all disorders of the alimentary canal which interfere with digestion and absorption; and in fact such disorders are probably responsible for by far the greater number of cases of anæmia that we meet with. This lack of assimilation may occur as an independent affection, and this is especially the case in those apparently idiopathic instances of anæmia which are so common among weak, sickly girls, and among many adult women. But it is also secondary to many forms of disease, both acute and chronic. Thus, most fevers and severe inflammations are associated with failure of appetite and digestion, and consequently with a deficient supply of the material of formation of the blood corpuscles. But it must be noted that, in spite of this deficiency of supply, and in spite of the increased metamorphosis due to the pyrexia, the number of corpuscles and the amount of hæmoglobin apparently suffer very little change in acute diseases. Here again, however, we have undoubtedly to do with a simultaneous diminution of plasma and corpuscles—a diminution of which our instruments give us no information; and the proof of this is that as soon as the febrile process abates, and the consumption of the water of the blood is thus lessened, a well-marked relative anæmia is detected, which persists through the whole period of convalescence.

In acute inflammatory affections, while there is probably in every case an absolute decrease in the number of corpuscles, in most cases a relative diminution can also be made out (Hayem) †; but this diminution is very variable in amount, and may be absent altogether. On the other hand, chronic diseases, if attended with mal-nutrition, are almost always marked by the existence of an anæmia which is both absolute and relative. Yet even in these cases the variations in the total quantity of blood render it difficult to say how far the anæmia is due to absolute decrease of cells, and how far to a relative increase in the water of the blood. Thus, the anæmia which is such a marked and apparently constant feature of chronic Bright's disease is doubtless dependent more upon the hydræmia existing in this condition than upon a real failure of nutrition. And, while most cases of phthisis show a progressive decrease in blood cells and in hæmoglobin, in many where the loss of water has been great, a plethora, which of course is only relative, has been found to exist. In chronic heart disease also the number of corpuscles in a cubic millimetre of blood may be either increased or diminished. In cancer, while there is usually a marked relative anæmia, exceptions to this rule are common. Yet it seems nearly certain that in all these disorders there is a diminution of the total corpuscular mass, which would be apparent in every instance if we only had the means of estimating the total quantity of blood in the body.

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* Leichtenstern, "Untersuchungen über den Hämoglobulingehalt des Blutes." Leipsic, 1878.

† "Courrier Méd.," Mar. 27, 1880; cited in "Med. Record."

In many chronic disorders a marked factor in the production of the attendant anæmia is the diversion of nutritive material from the support of the system to the maintenance of some constant drain. If food which should have been employed in replenishing tissue-waste has been used up in carrying on an exhausting suppuration, has been appropriated by a parasite or a malignant tumor, has been carried away in a diarrhœal flow or profuse sweat, or has been discharged with the urine in the form of sugar or albumen, the result, again, is the same as if that food had not been introduced into the body. Hence it is that there is a lack of corpuscle formation and a consequent anæmia in phthisis, chronic suppuration from disease of bones or joints, pyæmic abscess, cancer, sarcoma, and indeed all tumors of rapid growth, chronic Bright's disease, and diabetes.

Again, in many diseases, both acute and chronic, the effect of disturbances of nutrition is enhanced by the presence of a febrile process. Pyrexia by accelerating tissue-metamorphosis throws a greater burden upon the oxygen-bearing corpuscles, and so shortens the life of the latter. The increased destruction of the red cells under these circumstances may perhaps be due in part to the lessened power of resistance to morbific influences which an abnormally high temperature can induce. This would seem to be the case in malarial affections. But cell destruction from this cause is more properly considered under the head of toxic anæmia.

Such are in brief the etiological factors of this disease. The *pathological changes* are generally simple enough. In addition to those of the exciting disease, which of course are very various, they are generally limited to a decrease in the amount of hæmoglobin and in the number of erythrocytes. The alteration in these two elements is not necessarily coextensive. Frequently, while the number of corpuscles is lessened, the richness of each corpuscle in hæmoglobin is also diminished, so that the total amount of hæmoglobin is disproportionately low. This is especially the case, as Hackley * points out, in anæmia of long standing, where imperfect elaboration of the corpuscles is the distinguishing feature. This would occur when the cytogenetic organs had begun to share in the general depreciation, and so to perform their function in an inefficient manner. In recovery from acute diseases the number of corpuscles appears to reach the normal before the hæmoglobin (Baxter and Willocks,† Hunt), although the contrary has been maintained (Hayem).

In some cases of ordinary anæmia the corpuscles exhibit curious changes of shape. This is well seen in a case described by Tacey,‡ in which, moreover, the erythrocytes displayed a slow, oscillating motion, and the white corpuscles, which were numerically increased, showed only a feeble power of amœboid movement. Variations in size are also of frequent occurrence, the presence of cells of only 2 μ in diameter (microcytes) and of those of 12–14 μ having been made out by different observers.# Others have noticed nucleation of the red cells, and this especially in the severer forms of the disease. In symptomatic anæmia, according to Ehrlich,‖ the nucleated corpuscles are usually normal in size, and their nucleus is capable of proliferation. But none of these pathological changes can be regarded as constant. Fenoglio,^ in a series of eleven cases, found no alteration in the erythrocytes in regard either to size, shape, or nucleation, and his experience is undoubtedly that of many other competent investigators.

The total volume of blood is probably diminished in most cases of simple anæmia.

Changes in the bone-marrow, similar to those found in pernicious anæmia, have been observed in the symptomatic form of the disease as well, and are to be ascribed to the same cause, viz., an

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* "Supplement to von Ziemssen's Cyclopædia."

† "Lancet," July 17, 1880.

‡ *Ibid.*, April 2, 1881.

Litten, "Berl. klin. Woch.," Jan. 1, 1877. This author quotes Hayem to the effect that microcytes are constantly present in chronic anæmia.

‖ *Ibid.*, July 12, 1880.

^ "Sperimentale," xiv, 1880, p. 449.

attempt on the part of the blood-forming organ to make good the deficiency of blood corpuscles.

Evidences of deficient nutrition are among the pathological changes frequently met with. Such are the emaciation dependent mainly upon absorption of the body fat and, later on in the disease, adipose degeneration of the heart and other organs. In the later stages also, and when the blood is very watery, the evidences of transudation may be present in the form of dropsy and œdema.

The *symptoms* of ordinary anæmia are not always easily separable from those of the exciting disease. If, for instance, we find indigestion, nausea, and vomiting associated with pallor of the surface and impoverishment of the blood, it may become quite difficult to say which of the two sets of symptoms represents the primary affection, and which is to be regarded as dependent upon the other. For anæmia, which itself may result from disease of almost any organ in the body, can, if long continued, produce impairment of nutrition and function in every organ. The troubles so produced, however, are evidences not so much of disordered as of enfeebled action. Hence the whole system, as well as each particular organ, although working at a low level, works regularly and efficiently as long as no extra strain is called for. Accordingly, in the digestive apparatus there may be merely failure of assimilation and loss of appetite; but when attempts are made to force digestion, then pain, nausea, and vomiting will ensue. The heart, too, beats regularly until some exertion is made or some internal emotion stirs it into increased action, and then the patient is made aware by a painful sense of palpitation that "his heart is going wrong." The tendency to syncope which frequently exists is a further proof of the inefficiency of the heart when unduly stimulated. Physical evidence of the irregular action of this organ in anæmia is furnished by various cardiac and venous murmurs, although physicians are not yet agreed as to the exact interpretation to be put upon these phenomena. According to some, the existence of an anæmic heart murmur is due to the contraction of the heart dependent upon the diminished quantity of blood circulating through it, while the arteries, on account of the rigidity of their coats, remain dilated; it having been proved experimentally that a sound is produced whenever a circulating fluid passes from a smaller to a larger cavity (Chauveau).* In the same way these authors attribute the venous murmurs to the rigid distention of the jugulars by the surrounding fascia; this forms an expanded chamber at one spot, and the blood flowing into it from the more contracted portions above gives rise to a humming sound. On the other hand, Scheperln thinks that the cardiac murmurs are produced by a relative insufficiency of the valvular orifices, due to dilatation of the heart. Immermann, again, considers that there is a partial paralysis of the papillary muscles, allowing regurgitation through the auriculo-ventricular orifices. The lesion, whatever it is, that causes these sounds must be of a temporary character, since the sounds themselves usually disappear when the blood state is improved.

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* Thompson, "Physical Examination of the Chest," London, 1879.

The respiration in anæmia is usually quiet and orderly. On exertion it becomes rapid and panting, and there is a sense of marked dyspnœa. In very severe cases the dyspnœa may be constant. This takes place whenever the number of corpuscles is so reduced that the amount of oxygen absorbed by their aggregate mass does not suffice to meet even the ordinary demands of the system.

Deficient nutrition of the brain is evidenced by vertigo, headache, disorders of sight and hearing, and a general sluggishness of the mental faculties. Neuralgia may be present in the nerves of all parts of the body.

The muscular system is enfeebled, and there is a feeling of fatigue on exertion and a constant sense of lassitude which forbid active exercise.

Disturbances of the genital system may be induced in the direction either of torpor or of undue excitement.*

The decrease in tissue-metamorphosis is shown in the diminished quantity of solids excreted in the urine. In general there is an appearance of emaciation together with a loss of the normal consistence and elasticity of the tissues; and, as additional signs of the failure of nutrition, there may be falling out of the hair, thinning of the nails, and arrest of the sebaceous secretion, producing a dry skin and "pityriasis tabescentium."

The anæmic state may become the starting-point of various diseases. It acts partly by lessening the power of resistance to disease and of recuperation from injury; partly by directly inducing changes in the vascular walls or by permanently altering the conditions of blood supply of important organs. Among these more direct sequelæ are, on the one hand, phthisis and functional nervous disorders, such as chorea and hysteria; on the other, cerebral apoplexy and gastric ulcer as the result of nutritive alterations in the vessel walls of the stomach and the brain (Immermann).

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* Immermann, "Von Ziemssen's Cycl.," XVI, Art. "Anæmia."

(*To be continued.*)

RABIES—A POSSIBLE CAUSE AND A PROBABLE PREVENTIVE.

By L. L. DORR, M. D.,
SAN FRANCISCO.

It is probably owing to the great obscurity that surrounds the etiology, pathology, and treatment of rabies that it is exciting so much study. Taking these divisions of the subject up inversely, it may be remarked that experience in the treatment of this terrible disease has thus far furnished no favorable results. In this respect there has been less accomplished than in the case of any disease known to both ancient and modern times. In the few cases chronicled as cured there have invariably been good grounds to question the diagnosis; for in a perhaps purely nervous disease like this there is plenty of room for exercising the imagination both of the patient and of the physician. It is safe to say that in no case of undoubted rabies has death failed to result speedily, and that there is no known cure.

Of the pathology, we have none that is recognized by the general profession. Whether it is primarily a disease of the blood, which sooner or later affects the nervous system, or whether the effects are exerted directly on the nervous system, is not known. Both systems seem to be the theatre of the disease in man. No contusion or rupture of the skin can occur but there is of course more or less of an impression on the nerves; but it seems to be necessary that the poisonous saliva shall reach the absorbents to produce the effects, and then it is a comparatively few who are bitten by a really rabid animal who take the disease. Injury of the peripheral nerves when there is no possibility of the wound being poisoned may produce tetanus, a disease much resembling rabies. A comparison of these two diseases shows that the history is similar, the symptoms being markedly alike in many respects, and the results of treatment in most instances not much different, for Dr. O'Beirne, of Dublin, witnessed two hundred cases of tetanus without a single recovery. It may be that rabies is a form of tetanus, but that the special poison has a particular affinity for the nerves governing the muscles connected with the acts of deglutition and respiration. There are poisons that produce analogous peculiar and special effects. Dr. A. Flint, Jr., says: "Woorara, a poison, has the remarkable property of paralyzing the motor nerves, but leaving the nerves of sensation intact." This drug has been used in the treatment of both tetanus and rabies for these reasons, but with no marked results. Cantharis has a special effect on the mucous membranes of most persons, and it may kill if the dose is sufficiently large. There are many drugs, of vegetable and mineral origin, that have special effects on certain organs.

The symptoms of rabies are well known and generally unmistakable to an unprejudiced mind; but until we more fully understand the causes we can not expect to prevent this malady. The same may be said of the pathology; for until we understand the pathology, especially during its incubation, we can not expect to treat the complaint intelligently or successfully. But little has been said of the etiology in all that has been published of late on this subject, and when the pathology and treatment have reached a non-progressive stage, it is time—not to abandon them—but to direct the attention of thinking people to the cause, that steps may be taken for prevention; and there is something to be said on this point. We are not satisfied to sit down and say, "What can not be cured must be endured"; for what can not be cured in medicine must be prevented, says modern science. In recent medicine it is possible that the prevention of disease has done more to prolong human life than therapeutics, whether based on pathology or not. It may be that such will be the case with rabies; and that in the absence of any cure, and with certain death in prospect, the grain of prevention may be of great value. As instances where progress has been made by adopting this line of defense, it is only necessary to mention the management to-day of yellow fever, cholera, small-pox, etc. For these infectio-contagious diseases there are no cures, but we see how much can be accomplished by prevention; which in fact is almost total annihilation. How can these arguments be applied to rabies?

The Possible Cause.—In a study of the natural history of the dog we find that he is an animal existing in nearly every country of the world, both in the wild and in the domesticated condition. He is indigenous to nearly all lands. The theory that the dog is a descendant from the wolf is not tenable.

Rabies has been known among dogs as far back as history speaks of them. It is also found that it has prevailed most in the most thickly-settled countries, and those having the most intimate and constant communication with other nations; and from those peoples it can be traced just in proportion as they made discoveries and conquests of other lands; for wherever civilized man has gone he has taken dogs, and in those lands rabies has then appeared, and not until then.

In the Mauritius Islands it was not known until 1821, when it appeared soon after a dog arrived there on an English ship from Bengal. It is not mentioned whether this dog was allowed intercourse with the native dogs, thereby giving opportunity for generating or spreading the disease by contagion, but it is presumed the greatest liberty existed.

In Labrador, Liberia, Australia, Van Diemen's Land, and New Zealand, places in but comparatively slight communication with the rest of the world, rabies is seldom if ever heard of. In relation to Greenland, heretofore reckoned in the list, Professor Agnew says, in his recent "Surgery": "In 1863 it prevailed to such an extent in Northern Greenland as to destroy all the dogs in certain localities." It must be remembered that communication with Greenland is getting more and more frequent, and that the Esquimau dog is said to be fast crossing with the wolf. Erichsen says: "Rabies is not known in Central Africa in any animals."

As regards China and Japan, countries notably exclusive of both men and animals from foreign lands, and where they have mostly one breed of dogs, rabies is seldom heard of. Authorities differ, however, in this respect. Dr. H. W. Boone, surgeon in charge of St. John's College, Shanghae, China, writing under date of June 28, 1881, says: "The ordinary Chinese dog is large, sort of half-wolf, like Indian or Esquimau dogs, but they have small Pekin pugs and small Canton dogs. Chinese dogs occasionally cross with European dogs, but only at the few open ports. The pure Chinese dogs have hydrophobia, and did so in early days before foreign contact was common. Japan the same." Dr. D. B. Simmons, for many years a resident in Yokohama, Japan, writing under date of March 10, 1881, says: "I have never seen an unmistakable case of rabies in a Japanese. I saw one case in a foreign child who was bitten by a foreign dog, a Newfoundland. The dogs here are large wolf-like beasts, having their origin no doubt in China."

Without doubt dogs have been taken to all of these places, and perhaps allowed to live there for years, but they were probably dogs of a pure and original breed, and were not permitted to accompany or cohabit with the native dogs. And here hangs the point of my argument as regards the cause of rabies—that is, that a dog of a pure and original breed is incapable of generating rabies, and that it never appears in any land until such dogs breed in-and-in with dogs of other countries, producing the mixed or mongrel dog. All dogs receive and give the contagion, but only the mongrel can *generate it.* Such seems to be the proper deduction to make from the history of rabies, and such is the conclusion that observers of dogs and of this disease are fast approaching. Charles Hamilton Smith says that "the Newfoundland dog is an original breed, and true hydrophobia does not attack them in their native land." The same author, in speaking of Arctic dogs, says: "Arctic dogs in their native regions are not liable to canine madness." He also says: "Of all domestic dogs, the greyhound is the least liable to hydrophobia." It is also true that the greyhound is the least apt to breed with other dogs; they are peaceable, keep mainly by themselves, and are no doubt of a pure and original breed. Erichsen says: "Among dogs, rabies is the most common in those of mongrel breed, seldom affecting those of pure blood." John W. Hill, R. C. V. S., in speaking of the causes, says: "I am very much inclined to think breeding in-and-in encourages its development." Dr. Verity, in the Manchester "Courier" of 1876, says: "I have always had a strong opinion that breeding in-and-in tends to produce hydrophobia in the dog." There are many instances in human beings where crossing the race tends to produce men inferior in intellectual force and physical bearing, with a strong tendency to disease. If we want a perfect specimen of the intellectual and physical make of any race we find it among those of pure and unadulterated blood. The crossing of nations of the same race produces, undoubtedly, a superior class of men, but the crossing of different races only produces inferiors, natural criminals, and idiots. There are a few exceptions, but they only make the rule more apparent and forcible. The Caucasian and Indian crossing we all know the result of—weak, criminal, and sickly offspring. There are no King Philips or Sitting Bulls who are half-breeds. The results of the crossing of the negro and white man are numerous among us, and generally they are objects of pity, and die early. The few with us of the cross of Chinese and Caucasian are the despised of both nations. The Mexicans are largely a cross between the Spaniard and the native Indian, and are a weak, degenerating, dying people, far lower in intelligence and physique than the Spaniard of Spain or the historical Aztec. To return to the brute creation, it is only necessary to say that the breed is not improved by crossing the common horse with the Arabian or Shetland. Cattle are not improved by crossing with the buffalo. These instances all seem to admonish us to keep the breeds, whether of human beings or of animals, pure and of the original race. It may be that rabies is the result of the violation of this seeming law of Nature; and, if so, the prevention would be easy—that is, to allow none but dogs of a pure and original breed to live. How easy this would be to try in a land like England, where laws are made to be enforced; and it would not be hard to determine which were of a pure breed. It is possible, in my belief, that, if dogs of different breed were prevented from crossing or their progeny disposed of, rabies might be prevented. In the absence of a cure, the trial of this measure may be deemed advisable.

The question naturally arises, Which are the dogs of a pure breed? We have to regret that nothing is *positively* known on this point, history being incomplete. Recent authorities, such as Charles H. Smith, Thomas Bell, and Youatt, speak in no decided words on this point, using the indefinite terms probably, evidently, etc.; but the following-named are with little doubt directly descended from the wild dog: the shepherd dog, the mastiff, the greyhound, the hound, the spaniel, the Newfoundland, the Esquimau, the terrier, and the cur. The shepherd has been considered the primitive dog. He is no doubt the original dog of Western Asia and Egypt. The mastiff may be indigenous to England or the higher lands of Asia and Africa. The greyhound is very ancient, having been known three thousand years ago, when it differed in no important particular from that of the present day. The British Museum contains a group of greyhound puppies in stone, from the ruins of the villa of Antonius. The greyhound was an inmate of Anglo-Saxon kennels in the time of King Elfric. The hound and spaniel are natives of Spain. The Newfoundland is indigenous to that island, and was not known in Europe until imported from there. The Esquimau dog is a native of the more northern latitudes, and is more like the wolf than any other species, yet is reckoned as the native dog. The majority of those seen at the present time may be a cross with the wolf. The terrier is considered indigenous to Great Britain. Curs are the most numerous, and are the native dogs of many countries; but, having no well-marked characteristics, they have received no definite name, and are often confounded with the mongrel dogs. There may be others, but these are the principal ones.

The Probable Prevention.—It has been very generally admitted that climate makes no difference with the appearance of the disease. Professor G. Canettoli, in "Lo Sperimentale" for June, 1875, says, in writing of rabies: "This is a disease of all climates; the extremes have the smallest number." Mr. Hill says: "The influence of climate, season, or sex would appear to have little bearing on the subject." This conclusion is from a European stand-point.

The Pacific coast of America presents some peculiar features as regards this disease. We have in this city, and in a portion of the State, a peculiar climate, which can not be compared with that of any other portion of the world. But we have also in this large State, and on the Pacific coast, thickly-settled towns and cities where the extremes of heat and cold are well marked and can be brought into comparison with those of places in the Eastern States and Europe; yet, from Behring's Strait to Cape Horn, not a well authenticated case of rabies was ever known. Dr. Logan, recently United States Minister to Chili, in a little work published in Chicago, called "Physics of the Infectious Diseases," says: "Of the remarkable disease called hydrophobia, the author believes himself justified in saying that it has never been known upon the whole coast." Dr. F. C. Valentine, of Guatemala, writes, under a recent date, and after eleven years' residence in Central America: "I have not encountered one authenticated case of rabies during my residence here." Dr. G. Chismore, of San Francisco, a gentleman fond of dogs, and who lived several years in Alaska, says, under date of June 11, 1881: "I never saw or heard of a case of rabies among Alaskan dogs." Dr. F. W. Hatch, permanent Secretary of the State Board of Health of California, in a note dated February 20, 1879, says: "There are no cases of, or deaths from, hydrophobia on the records of the State Board of Health. Personally I know of no cases of the disease in the State." The records of the Health Office in San Francisco furnish no evidence that there has ever been a death from rabies in the city. Is it truthfully stated, then, that climate has no influence over this disease?

It seems to be well proven that rabies prevails more or less in nearly all portions of the world that have been long in communication with the older nations, but that it does not prevail on the American Pacific coast in any animals, brute or human, while at the same time there is every kind of climate from the north frigid, through the temperate and tropic, to temperate and frigid again. Whatever the future may bring, the past gives no record or knowledge of the existence of rabies. Why we are so wonderfully and fortunately favored can not, perhaps, be positively made out.

It is reasonable to suppose that among the many human beings and animals who are bitten every year by really rabid dogs in the Eastern States and in Europe, some one or more, considering the possibly long period of incubation, must have reached the Pacific coast; yet not one case has been developed, while dogs are numerous and of great variety, from the pure-blooded greyhound to the scurvy mongrel.

Dr. Verity, in an article on this subject which appeared in the Manchester "Courier" of 1876, approaches what may be considered some explanation. He says: "Certain peculiar changes in the system, possibly due to atmospherical influences, act in producing it." If this be true, may not other atmospherical influences act to restrain or annihilate the poison? We have a recognized condition of the atmosphere on the coast, called electrical; and all are aware of the wonderful effects of artificially generated electricity when used in the treatment of nervous and other diseases. A test of the power of the climate of the American Pacific coast to prevent the development of rabies can easily be made, with strong probability of proving a blessing to hundreds of human beings who have no other hope. The period of incubation is so long in many cases that several dogs known to be badly bitten by a dog known to be suffering with rabies could be sent here under guard and kept behind prison bars and under observation until the extreme limit was passed. Or a more practicable plan might be to have a number of the many persons who are annually bitten by rabid dogs in the Eastern States and Europe come to this coast, and remain here until the extreme limit of the possibilities was passed, selecting any place from Cape Horn to Behring's Strait, preferably, however, California, where we have a varied climate and all kinds of dogs, and are in close communication with all parts of the world. The patient having a knowledge of these facts, and the support of hope of escape, it might be a power to prevent an attack; and, if he were attacked, the disease might be so modified by the climate as to render it susceptible of cure.

NOTES ON THE FOCAL LINES IN ASTIGMATISM.

By WILLIAM C. AYRES, M. D.

Through the labors of Young,* Sturm,† Kummer, ‡ Helmholtz,# and Knapp,‖ it has been known for many years that astigmatism exists in the normal human eye, and, by the investigations of these authors, our knowledge of its nature has taken more or less a plastic form, even to those less skilled in mathematics than the subject would seem to require.

For instance, we are aware that the cause of astigmatism lies in too great a difference between the curvature of the different refractive meridians of the eye, whereby the whole dioptric system is unable to gather incident rays of light to a point-like union. Hence the name astigmatism.

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* Thomas Young, "Philos. Trans.," 1801.

† Poggendorf's "Annal.," lxv, 1845.

‡ Crelle's "Jour. f. Mathemat.," lvii, 1860.

"Physiological Optics," 1861, p. 246.

‖ Von Graefe's "Archiv," viii, 2, p. 185.

Helmholtz and Knapp have shown us that in the normal eye the vertical meridian of the cornea is more highly curved than the horizontal, or, what is the same thing, it has a smaller radius of curvature, and therefore its focal distance is shorter. By this condition, rays of light refracted by it must come to a union quicker than those from any other meridian of less curvature. In the normal eye, in which this relation holds good, we have a certain amount of normal astigmatism, but when the disproportion goes beyond a certain limit the eye is pathologically astigmatic, and must be corrected by cylindrical glasses.

The question naturally arises, Why should this difference be so constantly found in eyes which we call normal, or why should a "perfect eye" be astigmatic? If we are so inclined, we may find the reason in the fact that we are more generally called upon to inspect vertical lines, as they occur most frequently in the outer world, etc.; but it would also be a satisfaction if we could discover some factor in nature which is constantly at work to produce this greater curvature in the vertical than in the horizontal meridian. This I believe to be present in the method of development of the eye itself.

Of course there are laws in force in "the transformation of the homogeneous to the heterogeneous" of which we can know nothing, but if we consider the formation of the embryonic eye we can find a cause for the shaping of the cornea, and one, too, which is always at work, namely, the mode of development of the lids. We know that in the beginning there are no lids, and that the cornea is formed of a soft embryonic tissue, which must be very pliable from the manner in which it is made to take up its position in front of the lens after it has receded from the ectoderma and entered the cavity of the secondary ocular vesicle. Just after this the lids appear as a small circular ridge entirely behind the cornea, and grow directly outward. Then a tract of epithelium called the lid suture makes its appearance, which forms from the lid margins and directs the growth of the lids or pulls them down to the surface of the cornea. This growth takes place principally from above and below, and the substance for the lids, being pulled very close to the cornea, presses upon it and bulges the corneal tissue in such a manner that the curvature must become greater in the vertical than in the horizontal direction. In sections through embryonic eyes I have noticed this distortion, sometimes so great that there would be a considerable change of curvature in the part covered by the advancing lids from that which had not yet been reached by them, even recognizable with the microscope. This method of development is fully adequate to account for the particular change in the corneal curvature. In those cases where the resultant difference has not remained too great we call the eye emmetropic, but where the pressure has been excessive it may have produced abnormal astigmatism. Of course other kinds of astigmatism than that usually found according to this method of viewing the matter would have to be accounted for by some anomaly in the progress of development, but we find such anomalies frequent enough in the condition of the young lids. This theory, of course, we must take only for what it is worth, but I do hold that it is sufficient to account for the constant astigmatism which we find in all eyes, including those pathologically astigmatic.*

We know by the investigations of Helmholtz and Knapp that the surface of the cornea corresponds to that of a driaxial ellipsoid, and in the case of the eye the long axis is the antero-posterior optical axis, the short the vertical, and the intermediate the mediolateral axis. We know also from Sturm and Knapp that if this condition be only slightly exaggerated the dioptric system is no longer capable of forming a point-like focus, but the focus of the vertical meridians is an horizontal line, and that of the horizontal meridians a vertical line. By the mathematical discussion of Sturm it is also shown that the oblique meridians have no foci, but produce circles of dispersion between the anterior and posterior linear foci. The space between these lines is called by Sturm the focal interval. The whole condition is beautifully shown by the thread model constructed by Dr. Knapp, in which the focus of the vertical meridians is made to fall in an horizontal line which is in front, and that of the horizontal in a vertical line behind. In the focal interval (the distance between these lines in the model) there are no foci, a section of the bundle midway between the lines being a circle, which becomes an ellipse in sections on either side of the middle, the anterior system of ellipses having their longer axes horizontal, and the lesser continually decreasing until the short axis becomes zero, when the ellipse is transformed into a line, the anterior horizontal linear focus of the system. The same is true of the system of ellipses posterior to the middle, with the exception that they all have their longer axes vertical, and by continually increasing in eccentricity are finally reduced to the posterior vertical linear focus of the astigmatic system.

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* If we measure the radii of curvature of the corneæ of those animals which have slit-shaped pupils, such as the cat, the goat, etc., we shall most probably find that they are astigmatic in a very high degree. I am not aware that such measurements have ever been made, but there can be no other reason for such a freak of Nature. I mention this because it would be quite interesting to study the mode of development of the eyelids in these animals, to see if there be any great difference between their young lids and those of animals which have round pupils.

Knapp[*] has given us a mathematical demonstration of the reason why the foci of vertical and horizontal meridians should be lines. It is easy enough to take a mathematical formula and transform it by multiplications and divisions and weave it out into shapes which if interpreted in one way mean one thing, and in another way, another; but few of us are capable of realizing what all these transformations mean. While the result is strictly true, it must be preëminently a mathematical mind which can hunt out the meaning of each one of these mathematical transformations and apply it to the condition in the eye.

Therefore the mathematical reason why the focus of vertical meridians should be a line, *and an horizontal line*, must have something vague about it, and I must confess that for a long time my own ideas on this point were decidedly unstable. The mathematical demonstration is easy enough, but, to have a plastic knowledge of the facts, most people require something else than mathematical demonstrations. The practical demonstration is much more simple if we go at it with a model and an apparatus.

For instance, if we obtain a driaxial ellipsoid and look at it as if we were inspecting the cornea from before, we see that, if we imagine it to be cut by planes all of which run around the center like the spokes of a wheel, we only get a *regular* little surface between any two consecutive planes running around the whole ellipsoid when the planes are either vertical or horizontal. The surface between any other sections will be warped, and since perpendiculars or normals to these warped surfaces do not lie in the same plane, they can form no focus, since by the law of refraction the incident perpendicular ray and the reflected ray must remain in the same plane, and the analogous ray on the other side must bear a certain relation to them.

If we look again at the ellipsoid, and imagine it cut by a system of planes which do not run like the spokes of a wheel, but each one of them remaining vertical, or parallel to the plane of the vertical and long axis of the model, we see that we get a system of regular figures which are ellipses, and consequently can have foci; and, moreover, we can easily prove experimentally and also mathematically that they actually do, and form regular images in the case of the eye. It is by the refraction of these figures which are vertical that the horizontal focal line is formed, and furthermore we can show by experiment that the line is and must be horizontal.

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[*] *Loc. cit.*

If we cut the ellipsoid by a system of horizontal planes, the same will hold good for the posterior vertical focal plane.

If a ray of light coming from a luminous object falls upon the surface of any one of these little *regular surfaces*, it will be refracted by the surface, but the refracted ray will remain in the same plane as the incident ray, and the normal at the point where the original ray impinges, and by the oblique curvature will be sent into the interior of the ellipsoid. If we take a point precisely analogous but on the other side of the long axis of this secondary ellipse (made by the section), and let a ray of light from the same point fall on it, it will also be refracted, and will remain after refraction in the same plane as the incident ray, and the normal to the surface at this second point. It will also be sent into the interior. The regularity of the surface and index of refraction will cause it to meet the other at some point interior to the surface of the original driaxial ellipsoid.

The reason why the locus or sum of such foci made by the different section is a line, or nearly a line, is that as you pass away from the greatest ellipse (which lies in the plane of the long and vertical axis and which has the least amount of curvature) you go toward the side, and the curvature of the ellipses becomes greater and greater, causing, consequently, greater refractive power. At the same time the apex of each ellipse is farther in, or the long axes of the ellipses become shorter. These two deviations counteract each other and throw the foci in a line. The reason why the foci form a line is that, while the curvature and the long axis increase and decrease in an inverse ratio, and therefore hold the foci at a certain plane, the lateral motion of the refractive system is not fully counterbalanced by the increasing obliquity of the surface, and the foci will be displaced to the side. Therefore the sum of such foci will form a line. All of this can be demonstrated easily by experiments on any astigmatic eye.

Since sections parallel to one of the axes of a driaxial ellipsoid are the only ones which can develop a system of regular figures, it follows that they alone can refract light so as to form foci or produce images. We can easily show that such sections do form distinct images by making the artificial eye of Listing astigmatic and doing certain experiments with it. For instance, place a strong cylindrical glass in front of it: the whole system will be astigmatic, and if the screen be in the proper place we shall have on it a picture from the vertical planes, but spread out in an horizontal line. If we put a slit or stenopaic apparatus in front, with the opening vertical, so as to let only one of our system of vertical ellipses act, the picture will be perfectly distinct and of its natural size—inverted as a matter of course. To show that the focus of all these systems is an horizontal line, move the slit to one side; the picture will remain clear but will also move, and its motion will be in the same direction as that of the slit.

It is significant to notice that the extreme lateral position to which we are capable of bringing the picture by the lateral movement of the slit is just at the edge of the blurred picture of the astigmatic eye without the slit. If we move the slit toward the other side the image will travel slowly to the other extreme edge of the blurred astigmatic picture. By this experiment we see many things. First of all, that in astigmatic eyes the several systems of refracting surfaces which make the images are not placed like spokes of a wheel around the apex of the ellipsoid, since the curves made by such planes are irregular and can have no foci. They are perpendicular to the transverse axis and parallel to the long axis, as in the parts exposed through the slit in our experiment. Because the picture moves in the same direction as the slit, *but still remains distinct*, we know that the foci of all these systems are in a line, and also that this line is horizontal, since the picture has only a *lateral movement.*

Again, since the picture remains distinct when it travels to one side or the other, it must be made by regular curves or surfaces of the second order, and by a system of surfaces the section of which gives a regular curve when cut in a plane perpendicular to the plane of those sections, or, in the driaxial ellipsoid, perpendicular to the horizontal axis.

The fact that they give a distinct image also implies that they must be symmetrical above and below the horizontal axis of their own system in each case.

If the slit be held in an oblique direction no picture is formed, showing that the curvature in this direction of the slit is irregular and that therefore the refractive system can not produce a focus.

We thus have mathematical proof that the apex of each vertical refractive section as we pass to the side is closer to the middle vertical plane of the ellipsoid, which would tend to place the image farther back, if all other things remained the same; but we can also see that this is counterbalanced by the increased curvature of the ellipses of the sections, so that the foci of them all remain at the same distance from the vertical plane of the ellipsoid, or form a line.

Without mathematics we also observe that the reason why the image moves with the slit is that the sections pass to the side, and there can be no factor which will completely do away with this displacement; and, since the displacement is a continuous movement, the successive pictures would overlap one another and be blurred, while at the same time the motion caused their aggregate focus to be linear. Since there is no motion in the image when we move the slit, except an horizontal one, the line of the focus must be horizontal.

The principal point is that, while in a regular or stigmatic refractive system it does not matter in what direction the planes are cut, rays of light falling on them will all be brought to a focus, and this will be a point on account of the spherical or stigmatic condition of the structure. We remark, however, that all sections of such a body are curves of the second order, and must each one of them have a focus, and this focus a point or distinct image.

If the refracting surface varies in the least from the general regular system, there can no longer be a point-like union. An ellipsoid, paraboloid, or hyperboloid of revolution would probably give regular refractions, since sections of the curves in all directions would be equal; but as soon as we find a surface which does not give regular curves of the second order on section, then there necessarily comes the restriction that there must be a refractive condition of such figures which has peculiarities of its own according to its shape.

In the case of a driaxial ellipsoid we find such a figure, and also one which is very peculiar in that, if we cut it by a system of planes whose directions are anything except parallel to one of its axes, the surface between any two such planes is warped or askew; and, since such a surface can never have any two of its normals intersect each other, it can never form a distinct image by refraction. If there were only such figures to be found in a driaxial ellipsoid, we could never have an image from it; but this is not the case. Any section parallel to one of the principal axes will be an ellipse, and this ellipse can refract regularly and therefore give images. As already remarked, the system of refracting surfaces made by planes parallel to the plane of the vertical and long axis do refract and form an infinite number of images, there being an infinite number of such surfaces possible. These images are inverted and placed one by the side of the other, and if the images have any breadth, each must overlap the next, and consequently the image of such an astigmatic eye must be indistinct.

The vertical meridians, being much more curved, will have their foci brought together quicker and fall in an horizontal line, whereas the horizontal ones, which are less curved, will have a focus farther back and in a vertical line.

I may not have expressed myself with sufficient clearness, but if we simply consider that those sections which cause the formation of the focal lines can not lie in planes which do not cut regular curves from the driaxial ellipsoid, and seek to find such a system in some other direction, we can only discover it in sections parallel to one of the three axes (in the eye horizontal or vertical). The vertical transverse plane plays no part in the eye, or we should have three lines; only the longitudinal and the transverse are available. The longitudinal axis, or vertical sections parallel to it, give us the system of shorter radii of curvature, and therefore their foci all lie in the anterior horizontal line, while the horizontal system, parallel to the plane of the longitudinal and horizontal axis, furnishes the curves of longer radii, and gives us the posterior or vertical focal line.

CHRONIC CLUB-FOOT SUCCESSFULLY TREATED WITHOUT TENOTOMY, BY CONTINUOUS EXTENSION AND STRETCHING.

By JAMES S. GREEN, M. D.

It is not the purpose of this short paper to give a detailed *résumé* of the various modes of treatment of chronic club-foot as recommended by surgical authorities, but an acquaintance with such authorities justifies the following conclusions:

That surgeons are not all in accord with regard to the usefulness of tenotomy in the treatment of club-foot; that very few surgeons have now the hardihood to recommend it in the congenital form, after the clear proof that proper manipulation and retention from the hour of birth will eventually reduce the foot to the normal state; that no one claims that the division of the healthy tendon will restore the foot to proper form in the paralytic variety; but most authorities, and among them those of the highest rank, demand tenotomy in the chronic form especially, where the active tendons have assumed the condition designated as contractured and when point-pressure gives rise to spasm.

But it is the purpose of this paper, against "the influence of precedent and well-established authority," which "often obstructs the way of truth," to call the attention of surgeons to the fact that a large majority of the most intractable cases of club-foot can be successfully treated *without the use of the knife.*

To assert that in almost every case of chronic club-foot tenotomy is worse than useless, unnecessary and unjustifiable, and to say that the day is not far distant when tenotomy will be written only as one of the mistakes of past surgery, may be downright heresy in orthopædic surgery; but in view of the truth of the assertions above made, and of the fact that even at this late day an eminent surgeon of this city recommends a new cutting operation for club-foot in the case of a child three months old, in which after the division of the tendo Achillis the sole of the foot was laid open, and all resisting structures divided to the bones ("Medical Record," August 13, 1881, p. 189), it becomes my duty, as well as that of every conservative surgeon, to protest against the frequent use of the tenotome.

From a well-considered preface to a lecture on "Knock-knee and Bow-legs," by Dr. Newton M. Shaffer, of New York ("American Journal of Obstetrics," July, 1881, p. 756), I make the following extract, as fully expressing the proper condemnation of meddlesome orthopædic surgery: "Conservatism in orthopædic surgery, experience teaches me, is absolutely necessary. Operative surgery in orthopædic practice is, or should be, almost wholly unnecessary. Even tenotomy may be avoided in the treatment of club-foot, and in some conditions where contracted muscles exist, such, for example, as are found in chronic joint disease, we find ether removes the contractions. The conditions which require the knife in orthopædic surgery are rare, . . . and I have made it my rule, and it is a good one, never to use a knife to remove deformity when I can avoid it. We have no right to say, 'I can accomplish the *removal of the deformity* quicker by its use.' The question we must ask ourselves and answer candidly is: 'Will the ultimate usefulness of the member or members be greater if I remove the deformity quickly and merely save time thereby?' We have no right as conscientious surgeons to think of time or effort in orthopædic practice."

If the reduction of chronic club-foot is practicable by mechanical means alone, without discomfort to the patient, confinement to bed, excoriation of the soft parts, or synovitis of the joints involved, it is more rational and humane to adopt such a plan.

Forcible reduction of chronic club-foot, with or without tenotomy, for several reasons has frequently failed. With tenotomy the reduction is so rapid and violent that the parts have not time to become accustomed to their new position, and trouble ensues.

Without tenotomy, although slower, the large amount of force necessary to reduce the deformity produces excoriations of the soft parts and synovitis of the joints. In either case, the failure is due to misdirected and misapplied force.

To effect the purpose of safe, comfortable, and certain reduction of chronic club-foot by mechanical means, our instrument must perform the following functions:

1. It must effect by extension *the separation* of the articular surfaces of the bones involved exactly in the position in which they are presented by the deformity. The extension should be so complete that the synovial surfaces of the tarsal bones will slide *over* and *not upon* each other when the foot is twisted into its normal position. (This condition being obtained of itself reduces to a minimum the amount of force necessary to be exerted in moving the bones, which are thereby not jammed against each other, the synovial membrane and the cartilages injured, and ulceration of the soft parts made imminent.)

2. It should produce *the gradual* reduction of the foot to a normal position by continuous stretching, acting exactly in an opposite direction to the lines of the deformity.

In talipes equino-varus (the most common form) it should flex the foot, thereby overcoming the contraction of the gastrocnemius and soleus muscles, while at the same time it should abduct the foot, reducing the rigidity of the tibialis anticus and tibialis posticus muscles. It should stretch the plantar fascia, after overcoming the tendo Achillis and during the reduction of the tibial muscles. With all, the instrument should be light in weight, portable, and easily worn, so that the patient may assist the cure by walking upon the foot which is being gradually extended and drawn toward its normal position. It should be so constructed that as the opposing tissues yield to the applied forces the advantage gained, be it ever so little, can be easily seized and retained.

Injury to the soft parts and joint surfaces from the use of forcible reduction has induced a return of surgeons to tenotomy, while relapsing club-foot and secondary talipes valgus after tenotomy have diverted the attention of the profession in the opposite direction.

To show the way between these dangers and objections on either hand is the object of this paper, by presenting to the profession a case of chronic talipes equino-varus of ten years' standing which has been cured by continuous extension and stretching in four months by a compound club-foot splint devised by Dr. Charles F. Stillman, of New York. The case here referred to is not unique. Dr. Stillman published in the "Medical Record" for October 9, 1880, p. 396, an account of the cure of a case of talipes equino-varus of seventeen years' duration, in which a similar apparatus was used. There are other cases which have occurred in the practice of Dr. Stillman and myself, in which we have reached the same results, and which fully justify the views advanced in this paper; but the case presently to be recited and the one already published by Dr. Stillman are of the longest duration.

I shall first give a brief description of the instrument, which may be seen as applied to the deformed limb in Figs. 3 and 4. The compound club-foot twister is so constructed as to twist the anterior portion of the foot on the posterior at the medio-tarsal joint, and also to gradually and painlessly alter the angle of the foot with the leg at the ankle joint. It consists of a local extender, provided with a slotted arc for graduated movement, placed each side of the ankle joint, and another placed in front of the arch of the foot. Below these are attached to a flexible felt or leather sole, on which the foot is firmly fastened by bandages; and above they are connected to metal terminal plates, which are bound down to the leg by some immobile dressing.

This splint allows the foot to be twisted back into shape without pain, as it provides a local extension which relieves the parts from strain and attrition during the twisting, and also allows the patient to walk without interfering with the action of the instrument, the foot being completely under the control of the surgeon. The instrument and dressing used in the case now to be related weighed thirteen ounces.

The following history is given in the words of the mother of our patient:

"William H. P. is now fourteen years of age. During the first two years of his life he was perfectly healthy and sound in all his limbs. When he was two years old he had the scarlet fever, and during his convalescence he lost the use of his lower limbs. When four years of age, the left limb was entirely restored, but the right one was almost useless, and his ankle began to turn. The boy was then taken to a physician in Newark, N. J., who, after rubbing him with liniments for six months with very little benefit, sent him to Otto & Reynders for a brace, which he wore for six months longer, but grew steadily worse. I then took my son to the Hospital for the Ruptured and Crippled, New York. The surgeon cut the tendon behind the leg and put on another brace. Willie was in this hospital for three weeks, when he came home and became an out-door patient of the same hospital for one year, during which time I used electricity upon his limb at home. During the last three months of our attendance at the hospital Willie became much worse, and I gave up treatment in despair, and for one year nothing was done. Removing to Harrisburgh, Pa., a physician advised me to take him to Professor ——, of New York, and to get such a brace as he would recommend. In the summer of 1878 I took Willie to Professor ——, who examined him and said that 'no brace in God's world would do any good, and there was nothing else to be done but to cut it.' Not being able to bear the expense of the operation, nothing was done for another year. In 1880 I took him to Dr. C. M. Fields, of Bound Brook, N. J., under whose care he was for nearly a year, and who recommended me to try the method of Dr. C. F. Stillman before he should cut the tendons. In January, 1881, I placed Willie under the care of Drs. Green and Stillman, of New York."

As above stated, Willie was placed in the care of Dr. Stillman and myself on the 3d of January, 1881. The right foot presented a marked talipes equino-varus, acquired after scarlatina. The tendo Achillis was tense, bound down to the tibia, and much drawn up; the foot was so twisted that the astragalus was partially dislocated; the internal malleolus was imperceptible to sight or touch; and two large bursæ were present upon the outer edge of the foot, upon which the patient walked. The large toe was forcibly extended at an angle with the top of the foot. The tendons of the tibialis anticus and posticus were tense, as was also the plantar fascia. When either of these structures or the tendo Achillis was made tense by extension, point-pressure produced spasm. The deformity could not be reduced in the smallest degree by manipulation. Paralysis of the peronei muscles was marked. The leg, from the head of the tibia to the internal malleolus, measured 12 inches, while the left (well) leg was 14 inches in length. Circumference of right leg at the upper part of the calf, 6¾ inches; left side, 9 inches; length of right foot, 6½ inches; left foot, 7¼ inches. This comparison shows the extent of the arrest of development in the affected limb.

The position assumed by the right foot in standing (before treatment) is shown by Fig. 1.

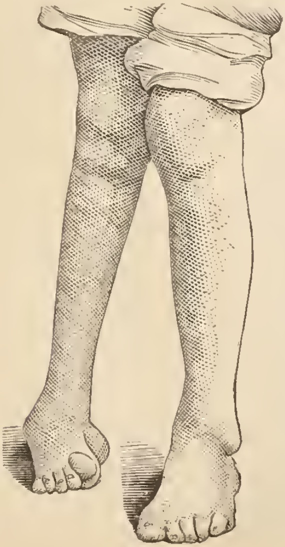
Fig. 1.

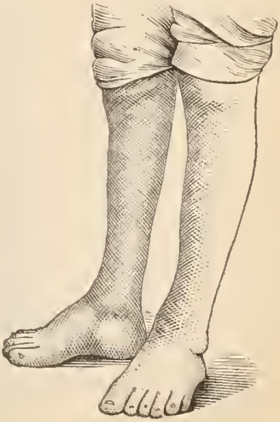
Fig. 2.

Dr. Stillman applied the compound twister to the leg and foot on the 12th of January, 1881, after which time the patient was under my care. After sufficient extension had been made, the foot was gradually flexed upon the leg and twisted at the medio-tarsal articulation, the clamps being loosened every two or three days and additional advance made toward the normal position. During the whole time the instrument was upon the limb the patient walked upon it.

No other treatment was used except to poultice the foot at night around the medio-tarsal articulation.

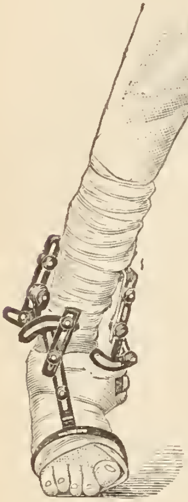

FIG. 3.

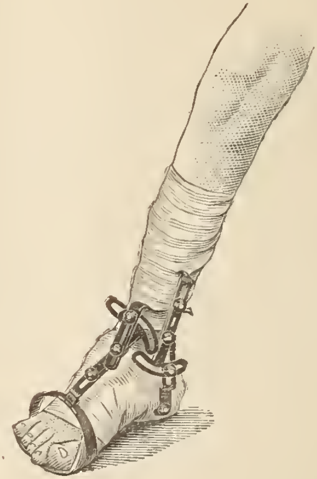

FIG. 4.

On the 23d of April, 1881, the instrument was removed, and the foot presented the appearance depicted in Fig. 2. The sole of the foot rested fairly on the floor with the knee not flexed; and, while the paralysis of the peronei remained, all contraction of the soleus and gastrocnemius, tibialis anticus and posticus, extensor hallucis longus, and plantar fascia had been overcome and the foot could be handled and placed in proper position with the slightest effort.

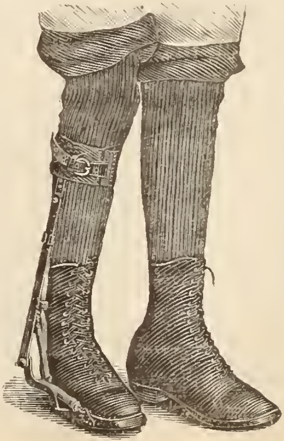

FIG. 5.

The astragalus had taken its right place, and the internal malleolus was apparent, as shown in Fig. 2, taken from a photograph.

Fig. 3 shows the twister as applied before extension, flexion, and twisting had been commenced. Fig. 4 shows the foot in the instrument just before its removal, on the 23d of April, 1881.

The reader's attention is called to the different positions of the arcs in Figs. 3 and 4, as giving an idea of the manner in which the gradual flexion and twisting were performed.

After the removal of this instrument the limb was placed in Dr. Stillman's club-foot shoe with a high heel, Fig. 5 (with an india-rubber everting cord and an elastic muscle to supply the defect in the peronei muscles), which the patient has worn since that time. At the present time (September 9, 1881) the calf of the affected limb has increased 1¾ inch in circumference, and the peronei muscles begin to show a slight return of power.

In conclusion, it may be stated that no excoriation or discomfort has been produced at any time during the treatment of this foot, and that no other means were employed except mechanical appliances and the constant use of the affected limb by the patient.

This concludes the history of a case of acquired talipes equinovarus which had relapsed after tenotomy, and, although pronounced incurable without a repetition of tenotomy, has been successfully treated by simple mechanical means properly applied.

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Editorials.

THE CASE OF THE LATE PRESIDENT.

It is generally safer not to render judgment until the testimony is all in. We have therefore refrained hitherto from expressing any opinion upon the case of the great and good man of whom an assassin has robbed us. The wisdom of such a course must now be felt, we should say, by certain hasty critics—perhaps by none more than by the author of the following remarkable note published in the "British Medical Journal" for September 17th:

"The cause of the incessant vomiting in General Garfield's case is supposed in America to be some old affection of the stomach—dyspepsia. It appears to have been treated very properly on this diagnosis, by giving the stomach as little work to do as possible, and supporting the strength by nourishing enemata; but the result has only had temporary success; as soon as solid food is given vomiting returns. The soundness of this treatment depends on the accuracy of the diagnosis. I do not allude to the advantage derived from it as a palliative to the symptom of vomiting; that would equally apply to another very probable cause, which is not uncommon in India in the affection called colon, of which I have had some experience. In this the vomiting is caused by inflammation or ulceration of the ileo-cæcal valve or the presence of a ball of indurated fæces in the cæcum. The treatment in this case is very similar to what has been employed in General Garfield's case, so far as diet is concerned, but the removal of the bullet is the leading indication of treatment, and that does not lie in the stomach, though the most prominent symptoms are shown there. The food, especially solid food, in passing down the intestines comes to the irritated or inflamed portion of the small intestine, and the intestinal action is reversed and the food thrown back into the stomach and vomited. There is no question in this case that the bullet is in the cavity of the peritonæum, apparently somewhere near the lower part of the ilium [? ileum]. In whatever place it may be, it must cause irritation in the surrounding structures. This irritation surrounding a bullet in the body—a not uncommon case—is often of little consequence, and after many months subsides; but in other instances it remains a permanent, but intermitting, source of inconvenience till the bullet be removed. But the case is different if the irritation cause the antiperistaltic action of the bowels and stop the nutrition which is supplied by the food taken into the stomach.

"In the present instance the prospect of the irritation caused by the presence of the bullet continuing till the reserve supply stored in the system has been consumed would indicate the necessity of removing it, or attempting to do so, as, at the worst, if unsuccessful, it would only accelerate the fatal result by a few days; whilst, if successful, it would save a valuable life."

This note would be absurd enough even without the revelations afforded by the autopsy; and yet it is positively the only adverse criticism that we have noticed in the pages of our foreign exchanges, and we have kept a very close run of what they have had to say of the case. Is it not about time, then, that the laity should cease to reproach us with lofty allusions to "severe English criticism" of the course pursued by the surgeons in charge? Criticism there has been (although for the most part utterly frivolous and vexatious) in some of our American exchanges and in the secular papers. To the credit of the latter it must be said, however, that never have they treated any great event affecting the medical profession with so much discretion and with so little parade of omniscience as, with some few exceptions, they have treated the long and painful conflict of surgery with the injury dealt to our lost President. For it was truly the modern art of surgery in all its fullness—not the mere individual capabilities of the little knot of men who stood as its representatives—that waged the fight. And the cause has been lost. If it has been lost because the surgery of the present day was not adequately brought to bear, then by all means let us have more criticism; let no light be hid that may serve to guide the way farther toward perfection in the future. It has been whispered that medicine will only be injured in public esteem by discussing this case. Out upon such timidity! If surgery is to be discussed publicly—and we see not how such discussion is to be avoided—by all means let the criticism come from within the circle of its practitioners, and let it be aimed at those who are capable of profiting by it. An art that will not stand scrutiny is not worth preserving. When a body of men professing to be devotees of truth cease to be self-critical they enter upon their decadence. If, then, any of Dr. Bliss's questions, as appended by him to his account of the case in the "Medical Record" for October 8th, can so be answered as to show that in any respect the conduct of the case could, without the light thrown upon it by the autopsy, have been better carried out, we trust that such answers will be brought forward speedily and boldly. For our own part, we see not one vulnerable point; we are fully persuaded that surgery did its best. It will not do, however, to say that the wound was of such a character that it was necessarily fatal. We believe that recovery from such a wound was well within the limits of possibility. Had the track of the ball behaved kindly, as such tracks often do without any sort of treatment, there would have been no blood-poisoning, and the ulceration of the splenic artery that led to the fatal hæmorrhage would not have occurred. The fragments of bone would have been got rid of in due time, and all would finally have gone well. From this statement it will be seen that we do not believe there was really a "traumatic aneurism," as Dr. Bliss seems to think.

The loss of the President, then, was a failure of surgery. It only shows that surgery is not all-powerful. None recognize this grim fact more keenly than its practitioners. But our profession has its detractors. They taunt us with the imperfection of our art. Will they kindly mention any human pursuit that has yet reached perfection? With a sneer they remark that medicine is not a science. Now, to our mind science is systematized knowledge. If these good people doubt that medical practitioners possess knowledge, let them try to master the great store of facts that constantly appall those of us who would fain keep pace with their growth. If they press the charge that our knowledge is not systematized, we answer: No, not by any means so thoroughly as it is our fond hope to see it become in the future. But here again we may legitimately fall back on the *tu quoque* retort, for what department of science is there so well rounded that no more work is left to be done in it? We repeat, then, surgery has fought a good fight—a fight that none of its practitioners need feel ashamed of, however much he may bewail the sad result. Had the case ended differently, Dr. Bliss might well have claimed a large share in the glory, whatever might have been thought of his deportment, for every man is entitled to be judged by his best work. Let not the record be sullied by our consenting to be represented by those who would interpose the bar of insanity between the wretched assassin and his doom.

While, then, we have nothing but praise for the surgeons as regards their actual management of the patient, we feel constrained to say that their bulletins were anything but creditable. If they were meant for the general public, they contained too much; if for the profession, far too little. Never at any time could we divine from them what the relation was supposed to be between the symptoms and the real condition of the patient. Humiliating though it be, we must confess that Mr. Blaine's dispatches to Mr. Lowell were always more to the point and in every way more satisfactory. To this day we do not know whether the temperature was taken in the mouth, in the axilla, or in the rectum. If the assertion is true that there were daily febrile exacerbations at other times than those at which the published observations were taken, we can scarcely justify the surgeons in withholding the fact. Just so soon as it was reasonably certain that the President was suffering from blood-poisoning a formal statement should have been made to that effect. The say-nothing plan upon which the bulletins were framed is extenuated, perhaps, by the desire, creditable in itself, to avoid giving publicity to any official opinion of the real gravity of the case, lest it might come to the knowledge of the sufferer himself. From such a point of view the course pursued was futile—and it might have been known that it would be—for utterances far more dismal than the apparent truth (coming, too, from persons whose opinions are ordinarily entitled to considerable weight) constantly found their way into the newspapers. From the scanty facts doled out to us during the eighty days' struggle, many of us clung fondly to the favorable prognosis that, for a great portion of the time, had seemed fairly admissible.

Reviewing the case briefly (for we do not propose to inflict upon our readers anything approaching a summary of what they have already read and pondered again and again), it resolves itself into several phases. First of all, there was the period of shock. It was then supposed that the ball had opened the peritonæum and probably entered the liver. Reaction, almost despaired of, came on before this impression was dissipated; then it was that some among us suggested laparotomy for the purpose of cleansing the peritoneal cavity and with a vague hope of finding and removing the ball. That suggestion was, we still think, justifiable under the circumstances, but, fortunately, this first error in diagnosis was discovered in season to avert what could scarcely have failed to be the result of carrying it into effect. The fact that the surgeons in charge did not hastily take up with this suggestion and their firmness in the face of the clamor that was raised, then and at various other times, in favor of cutting for the ball at all hazards, can not be recorded but with thankfulness.

Then, the wound having been determined to be extra-peritoneal, the chief dangers were felt to be that of secondary hæmorrhage and that of pyæmia. As the President, all things considered, went along very well for some weeks, barring the occasional derangement of the stomach ; as the phenomena that had at first turned attention to the probability of the spinal cord having been injured slowly vanished; and as what was all along supposed to be the track of the original wound was seen to behave fairly well—it came to be thought not only possible, but probable, that the case would end in recovery.

Somewhat suddenly—quite so, if we could depend upon the bulletins—came the parotid suppuration, the conviction that pyæmia of a pronounced type was established, and well-nigh the abandonment of all hope. As soon as improvement began again, however, hope sprang up anew and grew rapidly. Then it seemed as if the pyæmia had assumed the "chronic" form, from which recovery is not very uncommon. All but the pessimists felt relieved, although it was fully recognized that the President had still many a peril to brave. Even now, so nobly did his constitution bear the protracted strain, and so evenly were his bodily functions performed, we can not admit that the blood-poisoning would necessarily have killed him in the end. But two hidden agencies were at work to compass his destruction : ulcerative action in the undiscovered track of the wound, and a large abscess beneath the liver (most likely, as suggested by the "Lancet," originally situated within the capsule of that organ). The latter of these agencies was formidable, perhaps almost necessarily fatal, viewing the lowered state of the patient's vitality ; but its final action for harm was anticipated by the painful but speedy death caused by hæmorrhage due to ulceration of the splenic artery. The ball, having become encysted, had long since ceased to be an element of importance in the case.

It is not easy to point out wherein surgery may profit by this great case, but perhaps it may make us somewhat more alive to the possibility that a projectile, entering the body at short range, may take the obvious straight course, crashing clean through massive portions of the skeleton, and not necessarily be deflected. It may also teach us not to pin our faith too readily to the induction balance.

Special Articles.

REMOVAL OF THE UTERUS FOR CANCER.*

By ANDREW F. CURRIER, M. D.

Important as is this subject, on account of the frequency and malignancy of the disease, it has not received that attention here which it has received on the other side of the Atlantic. This is probably due to the apparent hopelessness of operative procedure at the time when cases usually come to the notice of the surgeon, and to the absence of enthusiasm upon the subject even in cases which, according to the present views of its pathology, afford some hope of a favorable termination—the latter condition plainly being a result of the former. It is, indeed, an operation before which a conservative and conscientious gynæcologist may well hesitate. With far greater technical difficulties than ordinary ovariotomies, the risks are also far greater. The common accidents of the operation, ligation of the ureters, perforation of the bladder and rectum, occasionally happen to those with the largest experience, and are sometimes inevitable. It is far easier to temporize and use palliative measures than to assume the responsibility of so great an operation when the chances are that the ultimate gain in months and days will be little or nothing.

But the question is being forced upon the attention of the profession, and, if American gynæcologists are to retain the advanced position they have reached, it must be disposed of either by conclusive proof that surgical means are uncalled for or by devising some operation which shall be an improvement upon those now in use.

With the statistics at hand it can be shown that a sufficient number of recoveries from *cancerous disease in general* has taken place to justify operation. Thus, of three hundred and forty-six cases of all varieties treated with the knife in Billroth's clinic, one hundred and four are supposed to have been permanently cured.

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* Mikulicz.—"Wien. med. Woch.," Nov. 20, 27, Dec. 25, 1880, Jan. 1, 8, 22, Feb. 5, 12, 19, 26, 1881.

Baum.—"Berl. klin. Woch.," Nov. 15, 1880.

Kocks.—"Arch. f. Gynäk.," xiv, p. 127.

Freund.—Volkmann's "Samml. klin. Vortr.," No. 36.

Credé.—"Arch. f. Gynäk.," xiv, p. 43.

Schröder.—"Ztschr. f. Geburtsh. u. Gynäk.," vi, 2.

Czerny.—"Wien. med. Woch.," 1880, No. 48.

Though cancer of the uterus is sufficiently prevalent in this country, its frequency is not equal to that which obtains in the older countries. A writer in a recent number of the "Annals of Anatomy and Surgery" has stated that the percentage in European countries is about twice as great as here, and that about half of our cases are among the foreign-born. Mikulicz says that four and a half per cent. of the deaths among women from twenty-five to eighty years of age in Vienna during the past nine years have been caused by this disease. The yearly average is about two hundred, being about four times as large as from breast cancer.

The question recurs repeatedly, *What is the cause of the disease?* and no one has, as yet, been able to give a satisfactory answer. We know *what* the disease is, can differentiate its cell, and the product of its destruction. We know, too, the method of its propagation and the channels along which it travels. We know it may develop from a benignant growth, at least so far as the microscope is able to decide, or manifest the utmost virulence at the start.

Baum says the more superficial it is the sooner it will ulcerate, and the more extend itself along the surface, and yet the longer will it remain local. Reasoning on this hypothesis, we see how entire organs and regions may become infiltrated with scarcely any appearance of ulceration, and this concealed progress adds greatly to the difficulty of recognizing the disease.

Emmet's opinion, that cicatricial tissue in the angles of a cervical laceration, by leading to disordered nutrition of the parts, in many cases results in carcinoma, is not to be lightly laid aside, especially in view of the fact that the very large majority of the subjects of this disease are women who have borne children. This is illustrated in his "Treatise on Gynæcology" by extensive tables which will repay careful study. Schröder, in a table of thirty-seven cases of supra-vaginal excision of the cervix for carcinoma, gives only two among sterile women. In one of these, a woman twenty-seven years of age, there was extensive infiltration of the cervix—a thoroughly hopeless case; in the other, a woman thirty-four years of age, the portio vaginalis was first removed, two years and five months later the operation was repeated, five months and a half from this the supra-vaginal operation was done, followed a year later by relapse, which is the last item entered previous to the publication of the table. Here the disease was remarkably slow in its progress.

Injury to the cervix is also undoubtedly received by sexual intercourse during pregnancy, after delivery before the organ has regained its normal condition in the unimpregnated state, and under many other circumstances when it is not in a condition of health. This fact is frequently brought to the attention of the gynæcologist, especially in out-patient practice.

If the disease is local—or, in other words, if it can be recognized while local—surgery can be looked to for effectual relief.

Like some of the other great operations, removal of the uterus is not a modern one. It is said to have been done before the tenth century. The Berlin and Göttingen libraries contain descriptions of its having been done for cancer by Andreas à Cruce, *mit Praemeditation und Kunst*, in the year 1650. Subsequently partial extirpations were done in France by Osiander and Lisfranc. In 1814 Gutberlet published at Vienna his prize essay upon the subject, and described the staff or sound (*Hohlsonde*) which was an important factor in the operation. The method was by abdominal incision, the patient's pelvis being raised and the intestines held back. The sound, of elliptical form, was introduced into the vagina, and an incision was made upon it from the pelvis, as upon a staff in lithotomy. The iliac arteries were compressed by an assistant, and the pressure was occasionally removed, in order to discover and ligate bleeding vessels. The ends of the ligatures were carried into the vagina, the wound in it was closed, and a moist tampon was introduced.

There is no record that the author of this operation ever performed it, but it was performed by Conrad Martin Langenbeck in 1825, and afterward by Blundell, Delpech, and others, in a more or less modified form, being called the *hypogastric method.*

The removal of the uterus per vaginam was done by C. M. Langenbeck in 1813, the case being one of prolapsed uterus and called *a case of scirrhus.* The specimen having been thrown away, the reliability of the operator's statement was questioned, but was established by an autopsy upon the patient thirty years later.

Sauter operated through the vagina in 1822. The bladder was wounded, but the patient survived four months.

Récamier operated in the same way in 1829. His method in brief was as follows: The abdomen having been opened by the anterior cul-de-sac, the lower segment of the broad ligament was ligated. The uterine artery was then tied in its continuity. The uterus was then separated from the bladder, and the upper two thirds of the broad ligament were cut away from their uterine attachment. A curved needle armed with a ligature was then passed from behind around the lower third, as additional security for the ovarian artery, and the remainder of the broad ligament was then divided. These steps were taken on both sides. The attachment on the rectal side was then released, and the organ was removed.

So few attempts at removal of the uterus were successful, either by laparotomy or per vaginam, that from the time of Récamier to that of Freund the operation gradually fell into disfavor and disuse. As late as 1876, however, Hennig, of Leipsic, performed the vaginal operation successfully.

The record of unsuccessful cases previous to Freund's is as follows:

Holscher, one; von Siebold, two; Wolf, one; C. M. Langenbeck, three; Barmer, one; Lizars, one; Roux, two; Récamier, one; Dubled, one; Dieffenbach, one; Blundell, three; Barnes, one. It will be observed that these are among the most illustrious surgeons of the times in which they lived.

Freund gave such an impetus to the operation as it had never before received. With the confidence of one who has discovered a great truth, he declared that cancer could be cured, and this enthusiasm found ready response in all parts of German-speaking Europe. It is somewhat remarkable that so grave an operation should at once have come into high favor with a people so conservative as the Germans; but the Franco-Prussian war had immensely developed the surgical resources of the profession; the brilliant operations of Langenbeck, Billroth, Esmarch, and Volkmann were producing their natural results, and, what is extremely significant, the study of pathology was becoming, or had become, so general that these facts, added to the great prevalence of the disease, constitute ample explanation and ground for the work of Freund and its ready reception. Whatever be the fate of Freund's operation, and that is now pretty well decided, to the man must be allotted the credit of turning a great tide of thought in a direction advantageous to humanity, and this though his own ideas and recommendations be displaced by others. The details of his operation are too well known to require statement in this paper, its object being to note the consequences flowing from it.

Kocks, of Bonn, was one of the first to do Freund's operation; indeed, before the publication of Freund's essay—that is, in August, 1876—he proposed a method quite similar to the latter's. After the abdominal incision he ligated in succession with catgut, on each side, the Fallopian tube, ovarian ligament, round ligament, layers of the broad ligament as far as the base, and last of all the base of the same, including the uterine artery and the vaginal wall. Then, after separating the bladder and rectum, the organ was removed. The internal wound was closed by uniting the peritonæum of the anterior with that of the posterior border, the ends of the ligatures hanging in the vagina.

What he says in reference to the course of the uterine artery is interesting and valuable: "It does not lie close upon the uterus, but runs at some distance away in the broad ligament, entering at the fundus. At the cervix it is about one centimetre from the uterus when unimpregnated. It makes a convex bowing toward the vagina before joining the uterus, removing it still farther, then approaches again, then winds between the layers of the broad ligament, anastomosing with the spermatica interna. Hence it would be possible to remove the uterus without wounding the artery, and this accounts for the slight hæmorrhage in some cases."

Taking the above-mentioned anatomical fact as constant, or nearly so, he suggests, as a means of getting rid of one of the greatest difficulties of Freund's operation, the leaving the uterine arteries unligated until after the bladder and rectum have been separated, a case being detailed in which this plan was successfully carried out.

To show the fatality of Freund's operation I insert a list of the recorded cases.* I could add to these the tables of Billroth, of Czerny, and of Freund himself, but these would not materially brighten the general appearance. Here, then, are thirty-six cases, in twenty-seven of which death quickly supervened from shock or septic peritonitis. The result in the remaining cases is not flattering; in one the disease was stayed for two and a half years; in two for about two years; death without relapse came in one at the end of two years; in the others either relapse had occurred at a shorter period, or data had not been obtained as the cases progressed.

Ahlfeld published a table of sixty-eight cases collected by him ("Centralbl. f. Gynäk.," 1880, p. 119) about two years after the first Freund operation was done. Of these, forty-nine died from the operation, in two the result was unknown, in four the operation could not be completed, in six relapse had occurred, the remaining seven had been successful up to that time. This number has since then been reduced by relapse in at least one case, which has already been referred to as described by Linkenheld. A more recent table by Kaltenbach describes eighty-eight cases, with fifty-eight deaths and four incomplete operations; but, as the question of recurrence is not discussed, the paper is deprived of much of the importance it would otherwise have.

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* Töplitz ("Centralbl. f. Gynäk.," 1879, p. 202), two cases; the first patient died in thirty hours from shock; the second case was successful, with no return of the disease within six months.

Alexander, of Liverpool (*Ibid.*, p. 203), one case, death in an hour and a half from shock.

Löwenstein, of Moscow (*Ibid.*, p. 406), two cases, fatal in less than twenty-four hours.

Fritsch (*Ibid.*, p. 406), one case, fatal in four days.

Shephard, Grand Rapids, Mich. (*Ibid.*, p. 477), one case, fatal in thirty-eight hours.

Martin (*Ibid.*, p. 545), six cases, five fatal, one not completed.

Fränkel ("Centralbl. f. Chir.," 1879, p. 191), one case, result unknown.

Oehlschlager (*Ibid.*, p. 203), one case, fatal in thirty hours.

Leopold (*Ibid.*, p. 271), one case, death in two and a half hours, caused by severe venous hæmorrhage from wounding of the parametric venous plexus.

Solojew (*Ibid.*, p. 854), one case, fatal in twenty-seven hours.

Solovieff ("Centralbl. f. Gynäk.," 1880, p. 181), one case, fatal in twenty-six hours.

Spiegelberg ("Arch. f. Gynäk., xv, p. 438), one case, recovery.

Janvrin, New York, one case, fatal in thirty hours, from shock. Noeggerath, of New York, has also done the operation, but I have not his statistics as to number or results.

Linkenheld ("Centralbl. f. Gynäk.," 1881, p. 169) refers to one of Freund's cases in which relapse has come after two and a half years, and remarks that such relapse is apt to occur in or near the wound.

Bruntzel, of Breslau ("Arch. f. Gynäk.," xiv, p. 245), six cases between May 10, 1878, and November 28, 1878; four of them fatal; one not completed; one followed by relapse in six months.

Rydygier ("Berl. klin. Woch.," Nov. 8, 1880), one case, fatal in forty-eight hours.

Schröder ("Dtsch. med. Woch.," Oct. 9, 1880) gives a table of eight cases, in five of which the operation was fatal, and in three the patients lived about two years.

As far as has been ascertained, these cases were operated upon strictly with antiseptic precautions as the Germans alone know how to carry them out. The operations were done by the most skillful surgeons. Freund himself was present at many of them. During the past year comparatively few operations—that is to say, Freund's operations pure and simple—have been done. It is safe to say that the operation has been superseded.

Freund and Fränkel say the operation is easy. Schröder, Olshausen, Ahlfeld, and Bruntzel call it very difficult, and objectionable chiefly in four particulars: First, its long duration with exposed abdominal cavity and intestines. Secondly, the difficulty and tediousness of applying the three Freund ligatures. Thirdly, occasional severe hæmorrhage from the uterine artery. Fourthly, the danger of tying the ureters and wounding the bladder and rectum.

Schröder and others speak of the damage done to the intestines by the long-continued manipulation as one of the most serious features. It is, indeed, remarkable that this severe treatment is tolerated in any case, and that all the patients do not die from shock. It is a common physiological experiment to stop the action of a frog's heart by tapping upon the intestines, and any one who has once been struck in this region can not forget the intensity of the resulting symptoms. In addition to the severe consequences already alluded to, it is possible that the heart structure suffers so seriously from the operation as absolutely to contra-indicate it. Bearing upon this subject, Binswanger, in a series of five autopsies after Freund's operation, found the cause in one case to be perforation of the peritonæum; in a second, uræmia after ligation of both ureters; in the remaining three, slight peritoneal inflammation and fatty degeneration of the heart, presumably a rapid result of shock ("Centralblatt für Gynäkologie," 1879, p. 4).

Schröder has discarded the operation, save in cases involving only the body of the uterus. Spiegelberg and Czerny express themselves in like manner. Baum declares, and is supported by others, that Freund's operation permits important parts of the pelvic tissue and organs to be overlooked in seaching for the extent of invasion of the disease. Hence it lacks the primary conditions of a good operation. He denies that there has been a single *permanent* successful result.

Of the modifications which have been suggested, the one by Credé would hardly seem to have been seriously intended had he not actually carried it out himself. He proposes a preliminary operation eight to fourteen days before the principal one, consisting in a resection of the horizontal rami of the pubes. The incision is eight centimetres long through the mons Veneris to the bone, having the clitoris for its lower limit.

The periosteum is separated anteriorly and posteriorly, then the inner portions of the rami are removed with the chain-saw. A segment only one centimetre in width is left to hold the pelvis together in front. The peritonæum is not to be wounded, and the section is internal to the obturator and epigastric arteries. By this means the edges of the wound can be separated to the extent of five centimetres, or twice as far as in an ordinary Freund operation. What is to be done for an attachment for the recti muscles does not appear. He expects to avoid ventral hernia by securing fluid stools and enforcing the horizontal posture for a long time after the main operation, which follows as above stated. In performing this he avoids the *mass* ligature of Freund, tying each artery and large vein requiring it separately before cutting away the peritonæum. A catheter is kept in the bladder, and care is taken to avoid the ureters in cutting the peritonæum posteriorly. The vaginal opening is closed by from three to five sutures, and the edges of the peritonæum are not brought together.

The advantages claimed over Freund's operation are: more space, and hence greater power to see and treat new growths; less hæmorrhage; and shorter duration.

Massari and Spiegelberg insist quite strongly on the necessity of a male catheter in the bladder as a guide against wounding the ureters. The latter claims that there is great advantage in cutting away the peritoneal covering of the uterus posteriorly quite high up on the anterior wall of Douglas's cul-de-sac instead of near the cervix, as is customary, maintaining that less hæmorrhage results, and that the operation may also be shortened by this means.

Bardenheuer's improvement is in the matter of drainage. He leaves the peritonæum unclosed, and allows a drainage tube of peculiar construction to carry off accumulations in the pelvic cavity. In four cases of laparotomy in which this method was used he saved his patients, and lost two in which it was not used; but this should not be taken as a basis for a hard and fast argument as to the security of the plan.*

Rydygier proposes to shorten the time during which the intestines and peritonæum are exposed by cutting around the portio vaginalis before making the abdominal incision. By this means the vaginal attachment is also freed with greater ease than would be the case in cutting from the pelvis. The vagina being cut through, there is also more light by which to distinguish sound from diseased tissue.

Confidence in this operation being lost, let us see what substitutes are offered for it; and it is to the removal per vaginam that we next turn. I have already referred to this, as practiced early in this century by Langenbeck, Sauter, and Récamier. It is the operation now used almost exclusively, where the entire organ is to be removed, by Czerny, Billroth, Schröder, Martin, and other well-known operators.

I take the liberty of introducing the description of this operation as performed by Schröder. "After the uterus has been forcibly drawn down with two pairs of Muzeux forceps fixed in the two lips, I cut into the anterior vaginal wall, . . . and free the bladder completely from the cervix.

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* In Kaltenbach's table, already referred to, twelve cases were treated after this method, three of them being fatal.

When this has been done the posterior vaginal wall is cut through, so that an incision is made entirely around the cervix, and then Douglas's space is opened. With scissors the section is extended as far as the recto-uterine ligament, then two fingers of the left hand are introduced into the abdominal cavity over the uterus and into the vesico-uterine space. I cut upon these two fingers, and also separate the friable peritonæum here without difficulty. Next the uterus, which is released anteriorly and posteriorly, but is still attached to the broad ligaments at the sides, must be tilted outward and cut away from them. For this purpose it is retroflexed by combined manipulation, and the attempt is made to bring the fundus through the wound upon the posterior vaginal wall. This is not altogether a simple thing to do, and is the more difficult the larger the uterus.

"It succeeds best if Muzeux forceps are fixed as high as possible into the fundus, and the latter then drawn through. When the uterine body, covered by peritonæum, lies in front of the vulva, care must be taken to ligate the broad ligament of each side in such a way that the uterus can be securely cut off without their slipping away. This is quite difficult of accomplishment if one desires to remove the tubes and ovaries completely at the same time, for the ligatures must then be introduced into the tensely drawn infundibulo-pelvic (round) ligament, from which they easily slip if it should retract upward after the separation, and give rise to a violent hæmorrhage, difficult to be checked. The operation is therefore greatly facilitated by deciding to leave the ovaries and terminal portions of the tubes *in situ*, and extirpating the uterus alone. As a rule, I have included each side in a *mass* ligature, and, in addition, just in front of this, in two individual ligatures, one for the upper, the other for the lower portion of the broad ligament. . . .

"Whether it can be said that the ovaries should or should not be left when the uterus is extirpated is a matter for the future to decide. One of my patients suffered very violent pains when the time of her next menstruation following the operation occurred.

"I am still deficient as to experience upon this subject. Probably it would be best, should a contemporaneous removal of the ovaries be found a necessity, to separate the broad ligaments close to the uterus, and remove the ovaries by themselves. When one broad ligament has been cut through, so that the uterus is secured only to the other, the ligation of this is remarkably facilitated. If the uterus be entirely removed, and the points of its former attachment still bleed, the divided vessels must be ligated. This can readily be done in the case of long stumps where the uterus alone is removed, but can hardly be done securely if the uterine appendages have also been cut away. In such a case we must seek to include the vessels with deep lateral sutures. The large perforating wound, including the entire vaginal wall, is treated by introducing a strong drainage tube with cross-pieces, and uniting the side sections. This is done by passing a strong needle through the anterior vaginal wall at the side of the tube, then carrying the ligature through the stump of that side as far back as possible, and so out again through the posterior vaginal wall. If this suture be securely placed, the remaining ones on that side can be passed without difficulty. The same thing is done on the other side. By this method we have the advantage that the suture ends from the stump do not lie in the peritoneal cavity, but in the vagina. In the arrangement of the sutures I do not pay much attention to an *over-careful* inclusion of the peritonæum. The subsequent treatment consists in plugging the vagina to a moderate degree with salicylated pads, the free end of the drainage tube being enveloped by the same. Irrigation through the tube is undertaken only when rise of temperature and foul-smelling discharges make it necessary. The tube and the sutures are removed after two or three weeks." Then follows a table of eight cases operated upon in this way, with only one death, and that by internal hæmorrhage from a small vessel in the broad ligament which was slightly torn by severe traction during the operation.

Czerny's method of performing this operation is essentially the same as Schröder's. In referring to it as Langenbeck's operation, he approves of it on account of the slight hæmorrhage and shock, but thinks it tedious, and that the healing of so extensive a wound surface as that in the vagina must be protracted.

Mikulicz, speaking of the operations done in Billroth's clinic, refers to the better success obtained since the method *per vaginam* was substituted for Freund's. He thinks that removal through the anterior cul-de-sac involves less danger to the ureters and bladder than that through the posterior. This method always presupposes that the uterus is of proper size to admit of its removal through the vagina.

Mikulicz also advocates a drainage tube somewhat similar to Schröder's. Baum has had two recoveries out of four operations by this method. Martin details eleven cases with seven recoveries. His practice is to remove the organ through Douglas's space, and while doing this he keeps the sides of his incision open with retractors, governing the movements of the uterus by a sound introduced into its canal.

The advantages of this operation over Freund's are enormous. There is but one section of the peritonæum, the intestines are unharmed, there is better opportunity to discover diseased tissue, which is most likely to be in the vicinity of the cervix, but, most important of all, the patients often survive, which is rare by Freund's method. As Schröder eloquently says: "After Freund's operation we observe among the patients, really without exception, that they have undergone a terrible ordeal, far reaching into the entire organism; indeed, not a few die simply because they do not recover from collapse, or, in other words, they do not survive the shock. . . . In marked antithesis are those cases in which the uterus is removed through the vagina. The patients present an appearance like that of normal lying-in women, and, though they may have lost much blood during the operation, do not appear very different from a puerperal patient with whom the hæmorrhage has been severe."

It is not by so serious an operation as either of those just described, however, that the greatest number are to be benefited; for, until materia medica can come efficiently to the aid of surgery in those cases in which the surgeon dreads the existence of an enemy which he can not reach with his knife, the most hopeful cases will be those in which the patients are warned of their danger in the early stages of the disease. For such the supra-vaginal operation of Schröder will be most helpful, which I shall describe as nearly as possible in the words of the author.

"The supra-vaginal excision of the entire cervix is begun by pulling down the uterus as far as possible with Muzeux hook-forceps fixed in the anterior and posterior lips, possibly dragging it so far that the os will lie in the ostium vaginæ. Then the vaginal mucous membrane throughout the entire area of the anterior lip is removed from one to two centimetres beyond the diseased tissue, the section being made so deep that it passes into the connective tissue adjacent to the cervix. The bladder can now be separated from the cervix with ease as far as the vicinity of the anterior cul-de-sac, and kept away, together with the ureters, if only the cervix be firmly held down. Only in exceptional cases is the connective tissue between the cervix and the bladder so dense and firm as not to admit of separation with the fingers, and require the use of scissors. When the anterior portion of the cervix is freed, the posterior vaginal wall is made accessible by drawing the posterior lip forward, cutting through and removing the vaginal mucous membrane just as far from the new growth as in the previous case, the division then being completed to the point of starting. With the freeing of the posterior cervical wall the peritonæum of Douglas's space is easily torn away. This requires no special precautions even in cases where the posterior lip must be amputated *very* high, if the peritonæum be approached *from before*, and the portion covering the cervix posteriorly removed. The lateral cervical borders are the most difficult to free. Here the connective tissue is firm and dense, and large branches of the uterine artery pass to the cervix. For this reason the scissors must often be used, and spurting arteries clamped and ligated. The other arteries, being forcibly dragged upon, bleed very little, as a rule. The cervix being now entirely freed, it is cut through at the desired level from the front, until the canal is reached. This being opened before cutting away the cervix completely, the anterior vaginal and remaining portion of the anterior cervical walls are joined with deep sutures. These sutures being passed and immediately tied, an excellent chance is obtained to *fix* the stump after the posterior wall of the cervix is also cut through. The divided surface of the posterior uterine wall is then covered without difficulty with the posterior vaginal wall. The lateral divisions are best united by causing one or more of the sutures to penetrate deep into the border of the uterus, and thus prevent all hæmorrhage in this direction. The danger of ligating the ureters need not be feared, for with the strong traction of the uterus downward, and the freeing of the bladder from it, the ureters are retracted upward for some distance. After the operation is completed, the vaginal wall appears firmly united with the remains of the cervix, anteriorly as well as posteriorly, by means of deep sutures, while deep sutures are also passed laterally, uniting vagina and uterus."

Out of thirty-seven cases operated upon in Schröder's clinic by this method between February 1, 1878, and August 25, 1880, only four deaths resulted, and three of these were considered due to imperfect precautions against sepsis. Relapse followed in most of the cases, but Schröder says this is not to be wondered at, since the operation was often attempted without any expectation of radical removal. The average period of time after operation before relapse was observed, in the thirteen cases where it was known to have occurred, was five months and eleven days, the longest time being twelve months and eleven days, the shortest one month and twelve days. In twelve cases the history was not followed. In three no relapse had occurred up to date of the last examination, the average time being four months and ten days. In three death had occurred without relapse after an average period of eight months and twenty-five days. In one the date of relapse was not recorded, and in one death came after nine months and ten days, the operation wound having never healed. These statistics are imperfect, since we are left in the dark as to many of the cases; and as to others it is impossible to say whether the disease progressed rapidly or slowly to a fatal termination.

This operation will undoubtedly have a future. While it is not so radical as removal of the entire organ, and hence not so efficient for cases involving the tissues above the internal os, it is an operation far less grave than either Freund's or the one per vaginam, and is, besides, more thorough than amputation of the cervix as it has been ordinarily done in the past. When it can be done, as is often the case, without encroaching upon the peritonæum, and suitable precautions against sepsis are observed (if *ever* such are warranted, they are in a condition of this sort where the opportunities for septic absorption are most inviting), it becomes reduced to a basis at once simple and hopeful. Spiegelberg speaks of its better adaptation to the papillary than to the infiltrated form of carcinoma, since the former remains local much the longer. The chances are that, if the mucous membrane of the canal becomes involved, the subjacent tissues are likewise.

I have entered into no discussion as to those cases in which the body of the uterus alone is involved. They are rare cases, comparatively speaking, and offer no alternative to laparotomy, either by Freund's operation or some modification of it. The most hopeful cases will be those which, discovered early in the history of the disease, are treated by Schröder's or some other similar method. At the same time surgery has not yet reached its limits. Billroth has already done his fourth resection of the stomach;

Kœberlé has successfully resected six and a half feet of the small intestine; Czerny has removed portions of the sigmoid flexure and colon; and in these operations about the uterus Bardenheuer and Mikulicz propose more extensive removals of pelvic connective tissue and resections of bladder, rectum, and ureters.

As to drainage—a most important item in such cases—a perfect system seems impossible. Bardenheuer's affords as good results as any yet devised, in cases where the pelvic cavity is entered, but in the hands of others has not fulfilled the expectations of its author.

The question recurs, finally, Are we approaching a solution of the weighty question: Can cancer of the uterus, and so *cancer in general*, be *radically* cured? The logic of events points to nothing but an affirmative answer. Otherwise, what is the meaning of the progress and discoveries in physiology, pathology, surgery, and therapeutics?

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Reviews and Literary Notes.

The Bacteria. By Dr. Antoine Magnin, Licentiate of Natural Sciences, etc. Translated by George M. Sternberg, M. D., Surgeon, U. S. Army. Boston: Little, Brown & Co., 1880. Pp. 227.

Dr. Sternberg, in the course of original investigations for the National Board of Health, had found the work of Magnin so very useful and so carefully done, that, on account of the widespread interest now felt in the subject, he has deemed a translation desirable. The copious bibliography has been brought up to date, including, therefore, that of 1880. The translator, in a few introductory remarks, strongly urges the taking of micro-photographs at all times, believing that these will serve to affirm statements of the presence or absence of fungi in disputed cases.

The introductory chapter is a brief historical *résumé*, which is tersely summed up as follows: In 1675 Leeuwenhoeck first recognized bacteria and vibrios. O. F. Müller in 1773 established two genera—the monas and vibrio. Next Bory de Saint-Vincent (1824–'30) included some infusoria under the monads, but described as genera vibrios and melanella, both of which belong to the vibrionides. Elsberg and Dujardin (1838–'41) denied the affinity of the elongated and punctiform (monas) bacteria. The latter divided bacteria into three genera: bacterium, vibrio, and spirillum. It was sought about this time to place the bacteria in the vegetable kingdom. In 1853 Ch. Robin demonstrated a relation between the vibrios and the leptothrix. In 1859 Davaine placed the bacteria in the vegetable kingdom. Up to this time all classifications of bacteria had been made upon the basis of their form and their mobility or immobility. The memoir of M. Hoffmann (1869) dates a new era, and sought to demonstrate: 1, that bacteria were plants having a very distinct cellular organization; 2, that they could only be classed according to their form and size; 3, that mobility or immobility was not a specific character. He also rejected the theory of spontaneous generation. In 1873 Cohn, who had written upon and studied the subject for twenty years, divided the bacteria, which he regarded as having affinities to, but not being, fungi, into four tribes, comprising six genera: sphærobacteria, or globular bacteria; micro-bacteria, or rod bacteria; desmo-bacteria, or filamentous bacteria; spiro-bacteria, or spiral bacteria. In 1874 Billroth wrote that there was but one species of bacteria (coccobacteria septica), that they differed in form (globular and rod-shaped) according to the medium in which they were placed, and that one form could pass into the other. In 1876 Cohn wrote upon the influence of temperature, etc., upon bacteria, also upon the bacillus developed in hay infusion. This was followed by Koch with researches into the development of the bacillus anthracis. Nägeli has more recently defined the bacteria as fungi which produce putrefaction.

The succeeding chapter, upon bacteria in general, discusses their structure and properties. They are spoken of as monads and bacteria, the former being globular, the latter filiform. The largest known is $\frac{2}{10}$ mm. in size, and is a spirillum. Certain monads have color of their own, and certain bacteria derive color from what they feed on. They may appear in a state of repose or of motion. The motion is either molecular or brunonian, or else more or less rotary, and is supposed to depend not upon the presence of cilia, but upon their nutrition or respiration, or the presence of oxygen. They have a cell membrane (Cohn); their body, which is a protoplasmic mass having vacuoles, consists of nitrogenous matter, occasionally containing colored particles, sometimes crystalline granules (of sulphur?); and all true bacteria have cilia. There are different modes of grouping in which they present themselves: thus, *unicellular*, in the form of single cells; in the form of chains—called *torula* in the case of spherical bacteria, and *leptothrix* in that of filiform bacteria; in masses imbedded in a gelatinous mucous substance—called *zoöglœa;* and in layers forming a membrane, as upon the surface of a liquid, without this mucous substance—called *mycoderma* (motionless bacteria); finally, in *swarms*, which are large *moving* aggregations of filiform and spiral bacteria.

In the succeeding pages we have a short account of the mode of distinguishing bacteria from inorganic substances, and of determining whether they be animal or vegetable in nature. In deciding these questions, authorities are not agreed upon the value of chemical, optical, or developmental characteristics, and give weight to the one or the other variously. Considerable space is next devoted to the detailed study of the classification and exact descriptions of individual species. The development of bacteria in air and water, their nutrition and respiration, the action of various agents (such as temperature, movement, and various antiseptics upon them), and a discussion of their modes of reproduction. In the chapter on reproduction by spores Van Tieghem's observations of the bacillus amylobacter is briefly given. "The development of a bacillus includes four successive periods. In the first, the stage of growth and multiplication, the body, cylindrical and slender, recently developed from a spore, stretches out rapidly and is partitioned; the articles soon separate (b. subtilis), or remain united in long filaments (b. anthracis)." "Secondly, the articles previously formed increase in magnitude, either uniformly throughout and remain cylindrical, or at one end and assume a tadpole shape, or in the center and become spindle-shaped." "In the third phase there is formed in each article a spherical or ovoid spore; this feeds upon the rest of the article, and the remaining protoplasm liquefies, disappears, and leaves the spore free. In the fourth period the spore begins germinating by sending out a slight prolongation from one side. It is from this fourth stage that the first described begins. It is also well established that not only a single spore, but a collection of spores, may be developed in the interior of the filaments."

The *rôle* of bacteria in fermentations, in putrefaction, and in contagious and infectious diseases is passed in review. Its uncertainty existing at the time of the publication of the original work, which unfortunately still holds, is aptly shown by the following quotations. "We can only insist upon the fact of the concomitance of the variola and the presence of micrococcus." "The demonstration of a causal relation between the micrococcus and diphtheria is not, then, yet established by these last experiments." The actual state of our knowledge is admirably summed up as follows: "1. The bacteria are cellular organisms of a vegetable nature. 2. That their organism is not simple, that they have cell structure (membrane and protoplasm), cilia and colored granules, grains of sulphur, etc., in their protoplasm. 3. That they form torula, zoöglœa, leptothrix, mycoderma, etc. 4. That we can not classify them on account of their affinities with the algæ on the one hand, on the other with the fungi. 5. That they develop not only by fission, but also by formation of spores and sporangia. 6. That these spores are the principal means by which these inferior organisms are disseminated."

The volume is well translated. In addition to the original plates, several photographs have been introduced, copied by permission of the National Board of Health.

We consider Dr. Sternberg's services in offering this translation as of great value, and think that they deserve recognition by the perusal of the volume by every member of the profession. The book furnishes an exceedingly clear and well-digested *résumé* of our knowledge, and is probably one of the best manuals for the student who would enter upon investigations of the subject of bacteria.

The Applied Anatomy of the Nervous System, being a Study of this Portion of the Human Body from a Standpoint of its General Interest and Practical Utility, designed for Use as a Text-Book and a Work of Reference. By Ambrose L. Ranney, A. M., M. D., Adjunct Professor of Anatomy, etc., in the Medical Department of the University of the City of New York, etc. With numerous illustrations. New York: D. Appleton & Co., 1881. Pp. xxvii–500.

Dr. Ranney has written a book which, if we may be pardoned the use of a somewhat hackneyed expression, supplies a place not hitherto filled in medical literature. It is not a monograph on the anatomy of the nervous system, nor yet is it a treatise on the symptoms of nervous disease. On both of these subjects we have books enough and to spare, but we have as yet no systematic exposition of those points in the anatomy and physiology of the brain and spinal cord which it is important for the physician to keep in mind when diagnosticating disease of these organs—no succinct account, that is, of the relations existing between their normal and deranged working. Hilton, "On Rest and Pain," makes, perhaps, the nearest approach to the idea which actuates the author of the book before us; but Hilton, while possessing a grasp of mind which enabled him to perceive the laws governing nervous distribution and an ingenuity which rendered him apt at applying these laws to the solution of a great variety of morbid phenomena, worked in a narrow field, and his whole treatise is merely the exposition of a single principle. There are many books, to be sure, which contain here and there hints in this field of great value to the physician, and the same is true of many special articles, monographs, and text-books; but the knowledge thus conveyed is either isolated, encumbered, or not readily accessible. It is Dr. Ranney's merit to have collected these scattered items of interest and to have woven them into an harmonious whole, thereby producing a work of wide scope and of correspondingly wide usefulness to the practicing physician.

The work consists of a general introduction, in which the laws of nervous distribution as enunciated by Hilton are formulated and explained, and succeeding portions treating in order of the brain, the cranial nerves, the spinal cord, and the spinal nerves. In each of these divisions the method pursued is the same. First sketching in a general way the anatomy of the part under consideration, the author next calls special attention to those particular points of both its anatomy and its physiology which will explain the symptoms due to morbid changes of the part. In doing this he omits all refinements of detail and all points which may be of interest to the professed physiologist or anatomist, but do not concern the practical physician. He lastly gives a summary of the principal clinical facts pertaining to disease of the parts, presenting in reality a series of abstracts of the causation, pathology, and symptoms of most of the organic lesions of the nervous system. The book, it will be perceived, is of an eminently practical character, and as such is addressed to those who can not afford the time for the perusal of the larger text-books and who must read as they run.

One of the merits of the author is that he has given the later researches in his chosen field. Thus, in treating of the brain, he gives the data which at present exist in regard to the localization of cerebral function and of cerebral disease, and in his chapter on the spinal cord he gives the new anatomico-pathological nomenclature, which, for clinical purposes at least, has superseded the old physiological designations. Likewise, in describing the various nervous diseases, he has drawn his statements from the more recent works of Erb, Rosenthal, and Seguin.

In a work of this kind, which is not designed to be an exhaustive treatise, much is necessarily omitted which many readers would like to have seen inserted. But within the limits which the very nature of his work has marked out for him the author seems to have chosen wisely such points as would be most valuable. The selection has been made from a number of different writers, and it is not wonderful that a work of such composite character should display every now and then unpleasantly abrupt transitions of subject and a certain unevenness and asperity of style, which the author will do well to correct in a subsequent edition.

The illustrations, the typography, and the general mechanical get-up of the book are worthy of all praise. Indeed, it is seldom that a work is issued from the medical press which is so sumptuous in design and execution.

A System of Oral Surgery: being a Treatise on the Diseases and Surgery of the Mouth, Jaws, and Associate Parts. By JAMES E. GARRETSON, M. D., D. D. S., Dean of the Philadelphia Dental College, etc. Illustrated with numerous steel plates and woodcuts. Third edition, thoroughly revised, with additions. Philadelphia: J. B. Lippincott & Co., 1881. Pp. 916. [Price, $8.]

A THIRD edition of this well-known and standard text-book is particularly worthy of notice from the way in which it has been thoroughly revised and brought up to date. It is in reality a new book, made up of much new matter in addition to the old, and illustrated with many new cuts, forming a complete work upon the branch of surgery of which it treats.

The first thirty chapters are devoted to what is generally known as Dentistry proper, or to the teeth and their diseases, with special chapters on the Surgical Anatomy of the Mouth and Face, Alveolar Abscess, Salivary Calculus, and Diseases of the Gums. Chapter XXXI is devoted to a consideration of the Aphthæ, among which are included Cancrum and Gangræna Oris—all of which are clearly described, with appropriate remarks on treatment.

After this chapter the author passes into what may properly be considered as general surgery, and, when we say that nearly every affection of the face and neck is described, the reader will gain a proper idea of the scope of the work. Chapter XXXII is devoted to Wounds of the Mouth and associate parts, with hæmorrhage, shock, and cicatricial contraction and deformity; and XXXIII to the Tonsils and Tracheotomy. Following these is a concise description of most of the diseases of the Tongue, with directions for remôval of the organ; with a chapter on the Floor of the Mouth, and another on Hygromata of the Neck. Diseases of the palate, the pharynx, the nose, the face, the antrum, and the maxillary bones, with neuralgia, tumors, and fractures, are all considered; chapters on the Anatomy of the Neck are introduced, and the work closes with a general consideration of Anæsthetics.

The criticism on the whole work which at once occurs to the reader is that it contains either too much or too little. As a work on the surgery of the head and neck it is good, but not great; there are many better ones to be had. As a work on Dentistry it is better than as a surgical text-book—but why include tracheotomy and lupus, especially when the author has nothing new to offer on any of these affections, with which the book is more than half filled? We notice that nearly all of the illustrations in the surgical part of the work are borrowed without acknowledgment, though most of them are so well known that acknowledgment is unnecessary.

The Diseases of Children: a Practical and Systematic Work for Practitioners and Students. By William Henry Day, M. D., author of "Headaches," etc. Second edition, rewritten and much enlarged. Philadelphia: Presley Blakiston, 1881. Pp. 752. [Price, $5.]

In size this work ranges between that of J. Lewis Smith and that of Meigs and Pepper, although there is probably no more reading matter in it than is contained in Smith's book. The present edition is considerably larger than the first.

The introductory chapter will compare very unfavorably with that of Meigs and Pepper on the general directions in the examinations and management of children, and the work is not fully up to the latest information on therapeutics. The author is evidently very fond of giving medicines, and in large doses—larger in some instances, it seems to us, than is necessary or judicious. Naturally the book will be compared with the two excellent works that we have mentioned. In its description of disease it will compare favorably with these. As a work of reference it is by no means equal to that of Meigs and Pepper, and in the matter of treatment it is far inferior to Smith's.

There are many very practical suggestions in the book. It is very judicious in its suggestions in reference to diet, clothing, and general hygiene—points of the greatest importance in the management of children. The use of fermented milk in the treatment of the diarrhœas of children is not referred to by Dr. Day. He objects, and very properly, to the use of farinaceous food for infants. We are glad to see him condemn the indiscriminate use of astringents in certain forms of diarrhœa, such as are accompanied by the passing of mucus and small quantities of blood and by straining efforts. In such cases he wisely recommends the use of small doses of castor-oil frequently repeated.

The book seems to have commended itself to the profession, as the second edition is called for. The mechanical get-up of the book is not of the best. The paper is poor, and the binding is only fair.

The Student's Manual of Histology, for the use of Students, Practitioners, and Microscopists. By CHARLES H. STOWELL, M. D., Assistant Professor of Physiology and Histology, and the Instructor in the Physiological Laboratory of the University of Michigan. Illustrated by 192 engravings. Detroit: George S. Davis, 1881. Pp. 290.

THIS small volume is profusely illustrated with one hundred and ninety-two woodcuts. It is well printed, and has a full and satisfactory index. We notice that Dr. Stowell is careful throughout to give accurate measurements of histological structures, in both text and plates. He also gives with a good deal of care the most satisfactory methods of preparing and mounting.

The work purports "to bring the subject down to the present time; to meet the wants alike of the student, physician, and microscopist." We think this little manual entirely too concise for the thorough student of histology. Besides its being limited to two hundred and ninety pages, it contains a great deal of microscopical anatomy, physiology, and pathology. There is a chapter on Microscopical Technology, another on the Pathology of Tumors, and another on Starches, taking up in all fifty pages.

In the remaining chapters, so much space is taken up with cuts that the author can hardly do justice to the main facts of histology. Under the head of "Connective-Tissue Group" we notice that the examination of white fibrous tissue is confined to subcutaneous tissue and tendons, without giving the reagents for dissociation of fibers in tendons. No mention is made of the pia mater and omentum as useful examples in the study of this tissue. Two short sentences only are devoted to fibrous cartilage; and about the same space is given to yellow elastic cartilage. There are no drawings illustrating these structures. We think the author is not sufficiently clear in all his statements about bone structure.

Many of the illustrations, taken from the works of Frey, Beale, Klein and Smith, and others, are not so well finished as they are in the original works. The original cuts are very badly executed; indeed, some of them are calculated to mislead the student. The chapter on Tumors is only an abridgment of the chapter in Green's "Pathology" on the same subject.

From the variety of subjects treated of by Professor Stowell in this little manual, and the brief consideration he has given to important tissues and organs, we think the work in its present condition can hardly be a valuable text-book in the hands of the student.

An Introduction to Pathology and Morbid Anatomy. By T. Henry Green, M. D., London, F. R. C. P., etc. Fourth American, from the fifth revised and enlarged English edition. With 138 fine engravings. Philadelphia: Henry C. Lea's Son & Co., 1881. Pp. xx—17 to 347, inclusive. [Price, $2·25.]

For a general idea of the merits of this work, of which much may be said, we must refer to the reviews of previous editions in other numbers of this journal. This edition appears three years after its predecessor, and contains sixteen pages of reading matter and six illustrations more than the third edition. The chief changes that have been made are the addition of a chapter on Anæmia, together with a few new ideas under the head of Nutrition Increased. Cohnheim's theory of the development of tumors from embryonic cells which had lain dormant until the growth of the tumor has been alluded to. Psammoma has been taken from among the sarcomata and placed among the fibromata, and a few changes and additions have been made in the articles on Hodgkin's Disease, Hyperæmia, Leucæmia, Inflammation, and Pyæmia. The book remains a very good elementary work on its subject, but the present edition is not a marked advance upon its predecessor.

The Principles of Myodynamics. By J. S. Wight, M. D., Professor of Surgery and Lecturer on Physical Science at the Long Island College Hospital. New York: Bermingham & Co., 1881. Pp. 162.

We fancy that most physicians who take up this book for the first time will think that they have made some dire mistake, and have been entrapped into reading some text-book of mechanics such as tormented them in schoolboy days. The pages fairly bristle with mathematical formulæ and diagrams, the mystery of which requires close study to unravel. For ourselves, we must confess that we do not think the game worth the candle, especially as the practical results which the author deduces are generally evident enough apart from any formal demonstration. Moreover, this technical preface is made unnecessarily obscure by carelessness of expression. Thus, the principle stated on page 54 does not hold good for all levers of the second order, unless for "pressure on the fulcrum" we read *strain on the fulcrum;* and, although levers of this class, in which the fulcrum is seated at the joint, are not found in the body, yet the author's statement would include this variety, and his diagrams illustrate it. Nor can we agree with the author in his use of "fulcrum" for the forces acting at the fulcrum. While there seems less to censure in the practical part, yet we would take exception to some things, as, for instance, the enumeration of *sixteen* muscles rotating the hip inward! Nevertheless, there are a number of statements in this portion of the book which are true enough, and may be useful to those who are making a special study of the subject. But, on the whole, a *raison d'être* for the work in its present form seems to be wanting; and the book, if it is to become acceptable to the general reader, needs remodeling both in matter and in style, the former being too technical and the latter too dry and discontinuous to engage the attention long without causing a sense of fatigue.

Hydrophobia. By HORATIO R. BIGELOW, M. D., etc. Philadelphia: D. G. Brinton, 1881. Pp. 154.

THIS is the first exhaustive treatise on the subject which has appeared in American literature. The history of hydrophobia, full of superstition and tradition, its almost mysterious character and awful progress toward a fatal termination, the heroic methods of treatment which have been at different times resorted to—all combine to make the subject one of great interest. The author has not only exhausted its literature, making his work valuable for reference, but has also introduced enough of the curious matter which he has encountered in his reading to make the book as readable as a novel. The questions of diagnosis, treatment, etc., receive each in its turn thorough discussion.

The Diet Cure: an Essay on the Relations of Food and Drink to Health, Disease, and Cure. By T. L. NICHOLS, M. D., etc. New York: M. L. Holbrook & Co. Pp. viii–88.

AN unpretending little volume, containing some valuable suggestions and not a few interesting statistics bearing upon the results of following certain plans of diet. The author is an extremist in some directions, however, as the following extract will show: "Live on bread and its equivalents, fruit and its substitutes in nice vegetables, with small additions, if any, of milk, butter (or other oil), mild cheese, or eggs, in all not exceeding twelve ounces of solid dry food a day. Two meals a day are better in most cases than three; in some it is best to eat only once in twenty-four hours." The author is a vegetarian, and believes that many, if not most, of our ills come from over-eating.

On Anchylosis, and the Treatment for the Removal of Deformity and the Restoration of Mobility in Various Joints. By BERNARD E. BRODHURST, F. R. C. S., Surgeon to the Royal Orthopædic Hospital, etc. Fourth edition. London: J. & A. Churchill, 1881. Pp. xi–100.

THIS book has now reached its fourth edition, and requires but a brief notice. The method advocated by its author is to divide subcutaneously all tendons and extra-articular bands that may be a hindrance to motion, and after the wounds have healed to forcibly flex the limb until the resisting adhesions are broken up. The limb is then put up in a fixed apparatus, no attempt being made to correct its position. After a few days passive motion is begun and continued until the joint has regained its function. Mr. Brodhurst thinks that by this method most limbs can be restored to a correct position and to usefulness. He records many cases in which it is claimed that cures have been effected in joints long crippled from disease, but these cases are so lacking in detail that they are useless for any purpose of study. There is nothing new in the book.

Books and Pamphlets Received.—Text-Book of Modern Midwifery. By Rodney Glisan, M. D., Emeritus Professor of Obstetrics and Diseases of Women and Children in the Medical Department of the Willamette University, etc. With one hundred and thirty illustrations. Philadelphia: Presley Blakiston, 1881. Pp. 639. [Cloth, $4·00; sheep, $5·00.] ═══ A Manual of Practical Normal Histology. By T. Mitchell Prudden, M. D., Director of the Physiological and Pathological Laboratory of the Alumni Association of the College of Physicians and Surgeons, New York, etc. New York: G. P. Putnam's Sons, 1881. Pp. vi–265. [Price, $1·25.] ═══ A Hand-Book of Vertebrate Dissection. By H. Newell Martin, D. Sc., M. D., M. A., Professor in the Johns Hopkins University, and William A. Moale, M. D. Part I. How to Dissect a Chelonian. New York: Macmillan & Co., 1881. Pp. vi–94. [Price, 75c.] ═══ The Harrogate Waters: Data, Chemical and Therapeutical, with Notes on the Climate of Harrogate. By George Oliver, M. D., Lond., Member of the Royal College of Physicians of London, etc. London: H. K. Lewis, 1881. Pp. xvi–224. [From Presley Blakiston, Philadelphia. Price, $1·50.] ═══ Fashion in Deformity, as illustrated in the Customs of Barbarous and Civilized Races. By William Henry Flower, LL. D., F. R. S., F. R. C. S., P. Z. S., etc. With illustrations. London: Macmillan & Co., 1881, Pp. xi–85. [Nature series; price, 75c.] ═══ Landmarks, Medical and Surgical. By Luther Holden, Ex-President, etc., of the Royal College of Surgeons of England, etc., assisted by James Shuter, M. A., Camb., F. R. C. S., etc. From the third English edition, with additions by William W. Keen, M. D., Professor of Artistic Anatomy in the Pennsylvania Academy of Fine Arts, etc. Philadelphia: Henry C. Lea's Son & Co., 1881. Pp. 148. ═══ Transactions of the American Gynæcological Society, vol. 5, for the year 1880. ═══ Transactions of the American Otological Society, ii, 5, 1881. ═══ Transactions of the Medical Society of New Jersey, 1881. ═══ Transactions of the Indiana State Medical Society, 1881. ═══ The Physician's Visiting List for 1882. Philadelphia: Lindsay & Blakiston. ═══ In addition we have received a number of pamphlets, the separate acknowledgment of which is prevented by lack of space.

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Proceedings of Societies.

NEW YORK SOCIETY OF GERMAN PHYSICIANS.

A stated meeting was held February 25, 1881, Dr. Gruening in the chair.

Extraction of Lens containing a Foreign Body.—Dr. Knapp introduced a young man who had come to him some time ago complaining of clouded vision; he had no knowledge of any accident to his eye. The ophthalmoscope revealed an incipient cataract and a small black spot near the margin of the lens. Under these circumstances the removal of the entire lens was indicated, but it was first necessary to bring the cataract to maturity by making a T-shaped incision into the anterior capsule, according to von Graefe's method. Four months later the lens was removed by linear incision in the usual manner, the foreign body proving to be a splinter of steel. Iridectomy was performed subsequently, to rectify some displacement of the iris. Three days after this operation the iris became adherent to the corneal wound, but this complication was overcome by the use of atropia, and the patient made a good recovery. Dr. Knapp remarked that Holtz's method of introducing a needle into the lens and removing it by traction was not advisable, for portions were very apt to remain. The removal of a foreign body from the lens by suction or with the magnet was also an unsafe procedure.

Resection at the Elbow for Fungus of the Joint.—Dr. Gerster introduced this patient, whose joint first became diseased in 1864, the affection running a very chronic course. Abscesses were incised and drained at different times. The diseased arm had the peculiar spindle-shaped form, the soft parts feeling doughy to the touch. The operation was done, without loss of blood, by Esmarch's method, and the joint was exposed by Langenbeck's dorsal incision; 2½ cm. of the humerus were removed, 4 cm. of the ulna, and 1½ cm. of the radius. The synovial sac and cartilage of the joint were found destroyed. The disease was recognized as a gelatinous fungus, implicating the bone and soft parts; no traces of osseous suppuration were found. The wound was closed by sutures, a firm antiseptic dressing was applied, and the arm was suspended by means of a dorsal splint. Considerable after-hæmorrhage took place, making it necessary to change the dressing soon. The wound healed radidly without fever, so that active and passive motion in the joint was begun on the seventeenth day. At present the patient could flex his arm to an angle of 95°, with but little "looseness" in the joint, lateral displacement being prevented by a splint with hinges, made of water-glass and strips of sheet-iron. Massage and the faradaic current would doubtless restore the arm to a useful condition.*

Two Cases of Uranoplasty were also exhibited by Dr. Gerster. One of the patients had suffered fracture of the lower jaw nine years ago, and a splinter of bone was driven into and fractured the hard palate, a portion of which became necrotic, leaving a triangular opening, 2½ cm. in length and 1½ cm. in breadth, in consequence of which the patient's speech became very indistinct, and particles of food frequently found their way into the nasal cavity during deglutition. In operating, it was found necessary to make use of a portion of the soft palate to cover the defect. The sutures were removed on the fifth and seventh days. ==== The second case was one of congenital cleft palate and hare-lip. Both operations were performed after Langenbeck's method, primary union taking place.

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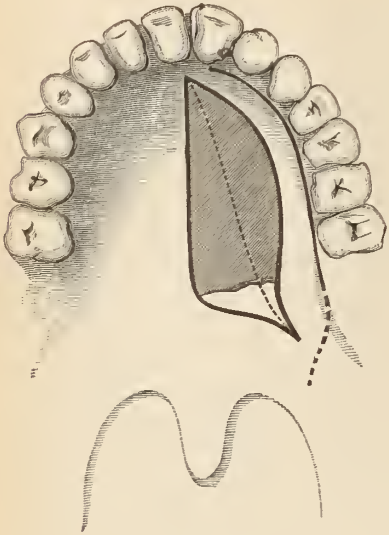
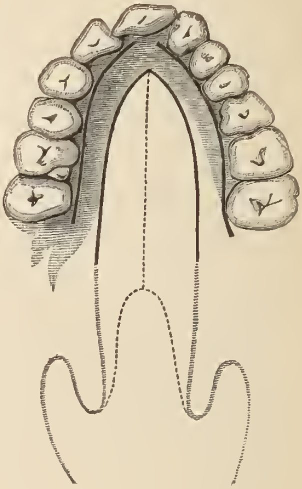
* In October it was ascertained that the patient was using his arm at his trade of candy-making with absolutely normal freedom of motion in flexion and extension, without fatigue or pain; supination and pronation imperfect; no fistulæ. Articulated splint lef off, there being no "looseness" present.





Extensive Nævus in a Child.—Dr. Fridenberg showed a child three months old with an extensive nævus of both upper lids, and the temporal and frontal regions. It was first noticed four days after birth, and of late spontaneous improvement had taken place. The symmetry in the position of the vascular tissue was noteworthy. ==== Dr. Jacobi remarked that a nævus situated over an unyielding bony surface might heal spontaneously, but, in the case presented, such a favorable result could not be expected, as the eyelids were the seat of disease. In answer to a question by Dr. Knapp as to the efficacy of galvano-caustic treatment for such erectile tissue, Dr. Jacobi said that he had reason to be satisfied with his results after a superficial destruction of the parts with the galvanic cautery, and he mentioned a case in which a large cavernous tumor of the upper lip was successfully treated by its application to the tumor through the mucous membrane. Where the disease was superficial, the application of a red-hot iron would often bring about coagulation of the parts without destroying the tissue to any extent. ==== Dr. Knapp remarked that in his experience such methods had not effected a permanent cure, the diseased condition remaining and continuing in its progress unless removed by total excision. ==== Dr. Adler reported the same experience as Dr. Knapp's, and had seen but temporary improvement from electrolytic treatment.

Fibro-sarcoma of the Breast.—Dr. Jacobi exhibited a tumor about as large as a hen's egg which he had recently removed from the breast of a young girl. It was of one year's growth. About eight weeks ago the soft parts surrounding the tumor became inflamed and infiltrated, as did also the axillary glands. This inflammation subsided after several applications of the constant current, and the tumor was then removed. ==== Dr. Knapp had frequently noticed inflammatory action in the neighborhood of osseous tumors of the orbit without apparent cause, the exophthalmus resulting therefrom usually subsiding very soon.

Median Lithotomy in a Child.—Dr. Jacobi exhibited a uric-acid calculus, weighing about 13·0 grammes, which he had removed from the bladder of a child two years old by median lithotomy. The day after the operation the temperature reached 102° F., but soon became normal, and remained so throughout. On the second day urine was passed *per urethram.* The extraction of the stone was somewhat difficult, owing to its large size. ==== Dr. Adler remarked that he had performed this operation according to Dolbeau's method, and recommended it highly. The neck of the bladder was forcibly dilated by a blunt instrument, and not incised as in the method of Marian. A calculus of large size might be safely removed by breaking it into fragments before extracting. Drs. Mason and Markoe had successfully operated upon children a year and a half old by Dolbeau's method. Blauvelt, in a recent thesis, had given a good statistical history of the operation. ==== Dr. Rudisch asked whether the forcible dilatation of the neck of the bladder would not produce injury to the seminal vesicles. ==== Dr. Adler answered that such injury had been recorded by Pitha after operations by Marian's method, and that the neck of the bladder could be safely dilated in young subjects.

Dr. Garrigues exhibited a monster of the variety micromelus.

A stated meeting was held March 25, 1881, Dr. Jacobi in the chair.

On behalf of Dr. Nolden, Dr. Gerster introduced an old man suffering from epithelioma of the nose and face.

Dr. Brandeis showed a patient who had lost the cartilaginous portion of his nose through a bite. Owing to a complete atrophy of the turbinated bones in consequence of chronic nasal catarrh, the action of the tensor and levator veli palatini upon the orifice of the Eustachian tube could well be studied, the orifice becoming enlarged during inspiration and deglutition.

Hepatic Abscess.—Dr. Heppenheimer presented a diseased lung, diaphragm, and liver, with the following history: The patient was in good health up to December, 1880, when he was prostrated by a copious pulmonary hæmorrhage. An examination revealed but slight apex dullness at the time. Shortly after this the patient suffered from an attack of pleurisy with effusion, and the hæmorrhage, which had not entirely stopped, ceased at once. Thoracocentesis was not performed, for fear of inducing renewed hæmorrhage from removal of the pressure. The patient expectorated large quantities of purulent and sanguineous matter, and soon died. The autopsy revealed a circumscribed cheesy deposit in the apex of the right lung; the base of the left lung was firm to the touch, and adhered to the diaphragm underneath. Toward the center the lung tissue was necrotic, and from the cavity thus formed a passage was found leading through the diaphragm into a large abscess situated near the convex aspect of the liver. This cavity communicated with a larger branch of the left bronchus. ==== Dr. Langmann remarked that in this case the hepatic abscess was assuredly the primary lesion. Four such cases had but recently come under his notice. Hepatic abscess was not so rare in our climate as was usually supposed. The symptoms were vague and indefinite. In one case dry pleuritic crepitus was the only symptom recognized, and the diagnosis was not made until after perforation into the pleural cavity had taken place.

Psycho-motor Centers.—Dr. **Seessel** read a paper on the present state of our knowledge of the psycho-motor centers of the brain, illustrating his remarks with a number of well-executed plaster casts. After the reading of the paper the society gave Dr. S., the author, a vote of thanks for the able manner in which the subject was presented.

Ulcerated Intestine.—Dr. **Heineman** exhibited two specimens of ulcerated and perforated intestine from typhoid fever. In both cases diarrhœa was present. ══ Dr. **Jacobi** remarked that in this country many cases of enteric fever with perforation of the intestine ran their course without diarrhœa.

Cerebro-spinal Meningitis.—Dr. **Heineman** also showed the brain of a child which died of cerebro-spinal meningitis. The pia mater was well covered by a purulent deposit. ══ Dr. **Brandeis** said that fourteen cases of cerebro-spinal meningitis had come under his notice, eight of which ended in recovery with total deafness. In the six fatal cases the hearing was good until death. ══ Dr. **Roosa** remarked that he had seen frequent recoveries from this disease without loss of hearing, and of the fatal cases some were complicated with deafness, others not. He believed that primary disease of the labyrinth was frequently mistaken for cerebro-spinal meningitis. ══ Dr. **Jacobi** stated that deafness after this disease was exceptional in his experience. He had seen many patients recover without deafness, about six per cent. of the recoveries taking place with loss of hearing, the deafness being usually absolute. ══ Dr. **Roosa** said that frequently such patients were not totally deaf, but were able to distinguish low notes. This seemed to indicate that the acoustic nerve was not destroyed, and that the seat of disease must be looked for in the middle ear or the labyrinth.

Cancer of the Dura Mater.—Dr. **Jacobi** exhibited a calvarium taken from a woman fifty years old, showing extended erosions and perforations in four different places, caused by carcinomatous degeneration of the dura mater. The lungs also contained a number of small disseminated cancerous deposits.

Dr. A. G. Gerster, *Secretary.*

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Letters to the Editor.

THE NATURE AND TREATMENT OF THE OPIUM HABIT.

The De Quincey Home, 191 West 10th St., N. Y.,
October 6, 1881.

Editor of the New York Medical Journal:

Dear Sir: The article by Dr. E. C. Mann, on "The Nature and Treatment of the Opium Habit," which appears in the October number of your valuable journal, is so filled with misstatements and inaccuracies, and is in part so evidently plagiarized, that I venture to ask you to allow me to answer it, not from any personal motive, but believing that the importance of the subject in question and justice to an author now dead demand it.

I would first call attention to the following comparison between a portion of Dr. Mann's article and a chapter from Calkins's book.* No mention whatever is made by Dr. Mann of Dr. Calkins, the material presented being offered apparently as the result of original research. That no credited quotation was intended is shown by the fact that a clumsy effort is made to alter the wording, and that parts are here and there left out altogether.

E. C. Mann. ("The Nature and Treatment of the Opium Habit." "N. Y. Med. Jour.," Oct., 1881.)	Calkins. ("Opium and the Opium Appetite," Philadelphia, 1871, pp. 23 et seq.)
"The early use of the poppy is made known to us through the ancient mythologies of the Greeks and Romans."	"In the ancient mythologies, Greek and Roman, the early existence and use of the poppy have abundant attestation."
"The Romans looked upon the plant as a gift from Ceres, and she is described as having a scepter in one hand and in the other the symbolic capsule."	"The Romans accounted the plant a gift of Demeter or Ceres, the goddess of corn, and she is described as bearing a scepter in one hand and in the other the symbolic capsule."
"It was the ancient custom to paint *Soranus* † as reposing upon a bed of snowy poppies."	"Somnus, also, was often painted as reposing upon a bed of snowy poppies."
"Catullus and Tibullus also mention this plant, while Homer speaks of the poppy as among the familiar garden flowers. Diodorus states that the women of Thebes were acquainted with an herb which, its alleged properties lead us to suspect, was the poppy. Pliny also understood its virtues, and Livy speaks of it as being in the gardens of Tarquinius Superbus, which shows that it was known to the Romans at least five centuries before the Christian era."	"Catullus adverts to the 'Lethæa papavera' and Tibullus to the 'medicata papavera.' Homer . . . names the poppy among the familiar embellishments of the garden. . . . Diodorus relates that the women of Thebes were acquainted with an herb having properties analogous to those of the poppy; certainly, though he does not specify the name, . . . Pliny . . . plainly well understood its virtues," etc. "The poppy was evidently known to the Romans at least five centuries before the Christian era, being spoken of by Livy as conspicuous in the gardens of Tarquinius Superbus."
"Hippocrates was also well acquainted with its virtues. The *Nepenthes* of the Odyssey, and the ancient cordials, probably contained opium and	"Hippocrates, A. C. 460, was acquainted with the same. All refer with various speculations to the *Nepenthes* of Odyssey, as described in Lib. iv, 220.

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* "Opium and the Opium Appetite," Philadelphia, 1871.

† Italics mine.

also Indian hemp, which imparted the intoxicating and exhilarating inspirations to such beverages.”	. . . The Nepenthes, a complex compound, and what Pliny thus adverts to as the ‘Nobile Nepenthes oblivionem tristitiæ afferens,’ not unlikely, as Dioscorides suspected, combined the Cannabis besides.”
“In China the opium used for smoking purposes is prepared with the greatest care from the crude gum, thus obtaining an extract or ‘*Tschandú*,’ which is about 54 per cent. of the original gum, and which yields more pronounced exhilarant and sedative properties, with a corresponding reduction of the narcotic element. In the region of the Bosphorus there is used a confection of the lozenge form, and these lozenges are sold publicly. At Cairo a conserve is sold, which, in addition to opium, contains hyoscyamus; while in India a similar confection contains Indian hemp or nux vomica. In Turkey the natives add to the gum opium ten per cent. of mercury to intensify the stimulation.”	“In China the process is conducted with the most scrupulous care. . . . This article, known as the *Chandoo* (Tschandú), which constitutes 54 per cent. of the original, is marked by a more pronounced development of the exhilarant and sedative properties with a corresponding reduction upon the narcotic element. . . . In the region of the Bosphorus there is used a confection made by combination with aromatics fashioned into the lozenge form. Pellets of the sort are put up in packets bearing the label *Mash Allah* (the great gift of God), to be exposed for public sale (Ollivier). At Cairo is found a conserve, *El Mogen* (Magoon), in which hyoscyamus is the adjunct. In India it is cannabis resin, or the datura, or nux vomica. . . . The Turks supplement the gum with the sublimate of mercury, to the extent, even, of 10 per cent. of the mass, and for the purpose of intensifying the stimulation.”

Here, again, we find Dr. Mann robbing Calkins, and mutilating a somewhat questionable passage, one of the most high-flown and sensational in the latter's work:

“When a man has once yielded himself up to the mastery of this appetite, the soul becomes contaminated, the moral sense obliterated, and all the finer susceptibilities and nobler aspirations decline and fade away; the aim in life becomes erratic and purposeless,” etc. —E. C. Mann.	“Let the man deliberately yield himself up to the mastery of a depraved appetite, the soul must, perforce, become contaminated from the festering virus, the moral sense will be perverted, the finer susceptibilities and nobler aspirations will decline and die out, and life's aim become erratic and purposeless.”—Calkins, p. 90.

This is but a part of the very evident plagiarism, the writer going so far as to lean upon Calkins for a description of the various preparations of opium, the classes by whom it is used, and the properties of the drug—facts with which it would be supposed that a gentleman of his large experience in this line would be tolerably well acquainted.

With reference to his figures relating to the consumption of opium in the island of Singapore, I can not see how they can be justified, and should like to know his authority for them. He says: "About 3,000,000 Chinese smoke opium, and in the island of Singapore 15,000 out of a population of 70,000 are similarly addicted." Careful estimates[*] recently made give us, as a low figure, 11,000,000 Chinamen smoking opium; and the population of the island of Singapore is not 70,000, but, as long ago as 1871, was 97,114.[†] He can not mean the Chinese population, for that was but 54,098 at the same date. The source of Dr. Mann's information regarding this matter must have been either incorrect or of very ancient date, in either of which events the statements would be comparatively worthless.

At p. 379 he says: "In 1228 we find the use of opium mentioned by the physician to Pope Nicholas IV." He has the date wrong, for the pontificate of Nicholas IV did not commence until 1288, and lasted nearly through 1292. In 1228, the date Dr. Mann gives, Gregory IX was in power. He has possibly misquoted Flückiger and Hanbury,[‡] who say: "*Opium Thebaïcum* was mentioned by Simon Januensis,[#] physician to Pope Nicholas IV (A. D. 1288–'92)," etc.

The statement at p. 378, that 150 grains of morphia are equivalent to about 1,200 grains of opium, is inaccurate in the light of our present knowledge. If he means 150 grains *hypodermically*, then he comes nearer the mark, but still errs, and, moreover, should say what he means, for loose statements of this kind simply do harm in that they serve as the groundwork for inaccurate and exaggerated statements at the hands of laymen who think they have a temperance mission. If the lady was taking 150 grains a day subcutaneously, the full history had better be published, for no *habitué* has heretofore exceeded 100 grains in twenty-four hours. Two cases in which this amount was thus used may be found in my work on "The Hypodermic Injection of Morphia."

It would be interesting to learn from Dr. Mann just what he means when he says (p. 378), "The use of opium tends to sterility and impotence, and to the extinction of the *reproductive propensities*."[‖] Is this inadvertent tautology, or an instance of very fine differentiation? That the *continued* use of opium produces a cessation of menstruation and a loss of sexual desire in women, and loss of sexual appetite and power in men, is a well-known fact.

The statement at p. 379, "that, calculating the consumption of 299 smokers in Singapore, each smoker consumed what was equivalent to 50 grains of crude opium daily," is nonsensical, as also is the passage, "when used to excess, it is said that 116 grains have been consumed in this manner." A by no means excessive smoker, be he Chinaman, Malay, or American, will consume daily by smoking from 60 to 180 grains of smoking-opium, which is equal to from 120 to 360 grains of the crude drug.[△]

The sentence commencing, "It is recorded[◊] that, calculating the consumption of 299 smokers," etc., has at first sight a very ogrish look, the more so from the well-known fact that the Chinese population in this island is diminished at the rate of about one Chinaman per diem through the ravages of tigers, who cross the strait and carry them off.

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[*] "The Chinese Opium Smoker," London, 1881.

[†] "Appletons' Encyclopædia," article "Singapore."

[‡] "Pharmacographia: A History of Drugs," London, 1879, p. 44.

[#] "Clavis Sanationis," Venet., 1510, p. 46.

[‖] Italics mine.

[△] Williams, "The Middle Kingdom," New York, 1879; Abbé Huc, "Travels in China," New York, 1855; Shuck, "Portfolio Chinensis," Macao, China, 1840; Calkins, *op. cit.*; Kane, "Harper's Weekly," Sept. 24, Oct. 8, 1881, article "America Opium-Smokers"; "Med. Record," Oct. 15, 1881, "The Chinese Opium-Pipe as a Therapeutic Agent."

[◊] Where?

The statements at p. 381, parts of which are plagiarized, that "the *habitué* has the misery and curse of seeing his children inherit the physical expression of general enervation and the mental aspect of dulless and idiocy," and "These children, with their feeble, broken-down constitutions, inevitably fill, as they grow up, our prisons, almshouses, and lunatic asylums," are far from being susceptible of proof with the facts now in our possession. If Dr. Mann can furnish such proof, he will put the profession under obligation, and free himself from the unpleasant odium of writing that which lacks proof, and therefore partakes of the nature of bombast and sensationalism. Such loose statements, even when partly true, have done much to clog the wheels of scientific advancement in any branch of medicine. This is more especially true of the opium habit, which, bordering on the temperance question, has, like it, been treated with much gush and but little scientific study.

It is a well-known fact that the majority of opium- and morphine-takers in this country are people of the better classes, and those who, *if children were born to them while inordinately using these drugs*, would be in a position to keep them out of the "prisons, almshouses, and lunatic asylums." The *habitué* must needs be thoroughly saturated with the drug in question (*and consequently unable to have children*) to so impress a child as to guarantee it a broken-down constitution and an inherited tendency to crime, idleness, vagabondism, and insanity. Furthermore, it seems natural that, if the child of an *habitué* were liable to acquire a tendency toward anything, it would be toward a craving for some preparation of opium, and I find that in the case of nearly one hundred opium *habitués* whom I have myself treated, and to each of whom the inquiry was carefully put, in but one case was there a history of the drug's having been used by either parent.

The statement on p. 381, that "voluntary renunciation of opium by one who has become addicted to its use is unknown to the profession," is far from being true, as I can bring forward several well-authenticated cases to prove.

That the habitual use of opium in any form produces epilepsy and paralysis (as stated at p. 383) is not proved by any well-authenticated cases. I have heard of paralysis from this cause, but have never yet been able to prove the fact to my own satisfaction.

While denying that the habitual use of opium or its alkaloid ever produces "intellectual insanity," Dr. Mann paints a very fair picture of such a condition in his article. That opium does produce this condition is well proved by cases that I have seen, by cases that have been under the care of Dr. Hamlin, of the Washington Asylum (now at Auburn, N. Y.), Dr. Spitzka, of this city, and Dr. Shurtleff, of the State Insane Asylum at Stockton, California. I would also refer him to a careful reading of Emminghaus ("Psycho-Pathology"), Levenstein ("Morbid Craving for Morphia"), Lähr ("Ueber Missbrauch mit Morphium-Injectionen," "Allgemeine Zeitschrift für Psychiatrie," 1872, Heft 3), and Fiedler ("Ueber den Missbrauch der Morphium-Injectionen," "Zeitscrift für Medecin," 1874, Nos. 27 and 28; "Jahresbericht der Gesellschaft für Natur- und Heilkunde," Dresden, 1876, p. 185.

Dr. Mann has depended so largely upon Calkins for the subject-matter of his article, that his paragraph relating to the forms of insanity produced by opium-taking is quite refreshing if not correct. If he had read Calkins carefully he would have found at p. 81 the following: "Among opium-eaters has been observed an occasional tendency to some form of *mania.* For the years 1861–'66, there were counted up at the Pennsylvania Hospital for the Insane thirty-five men and thirty-six of the other sex coming under this class, and by the year following the proportion had considerably increased. Dr. Gray, Superintendent of the Utica Asylum for fifteen years, writes that, during his administration, although cases applying have generally been rejected, yet there have been received there of insane people as inmates, who were also confirmed opium-eaters, fifteen persons, all of whom, with a single exception, were women; and further, that seven of them recovered from their principal malady (for the opium was stopped, of course), four made no improvement, and five died." Other facts are also given by Dr. Calkins.

Emminghaus says, in his "Psycho-pathology," etc.: "The mental derangement known under the term opiophagism is characterized by a sullen disposition, moodiness, and weakness of memory, and a progressive imbecility is made manifest. Loss of energy, especially in battling with the habit, and finally abulia and moral deprivation, result. Sometimes there are attacks resembling delirium tremens, especially when the use of the drug is suddenly stopped. Sometimes dementia with general paralysis supervenes." I can refer Dr. Mann to the history of several cases bearing out what is here said, and can show him one of like nature in this city to-day.

The plan of treatment by rapid reduction, the bromides, diuretics, general faradization, and tonics is that which was advocated and carried out by Dr. J. B. Mattison, of Brooklyn, in 1874, and to him belongs the credit for it. The "bitemporal-current" treatment (mentioned at p. 385) was first tried by Dr. W. F. Hutchinson, of Brooklyn. A full description of his method of procedure may be found in my first work on morphia.*

In conclusion, I would say that the inaccuracies and false statements in Dr. Mann's article, which I have pointed out, are sufficient justification, to my mind at least, for having imposed this long letter upon your readers.

Very respectfully yours, H. H. Kane, M. D.

GRAY'S "ANATOMY" IN CHINESE.

Canton, China, *August* 16, 1881.

Editor of the New York Medical Journal:

Sir: The advance of medical science in China does not attract much attention in outside countries, but there are many members of the profession who will be glad to learn that a complete "Anatomy" has been published in the language of that country. The translation is the work of Dr. Osgood, late of Foochow, and it is printed from metal type, with electrotype illustrations, at the press of the American Methodist Mission, Foochow, China.

The full title of the work is as follows: "Anatomy, Descriptive and Surgical, by Dauphin W. Osgood, M. D., late Medical Missionary of the American Board of Commissioners for Foreign Missions. In six volumes. Illustrated by two hundred and sixty-five electrotype plates. With a vocabulary in English and Chinese. Foochow: American Board Mission, 1881." In an English preface attached to the work it is stated that "The general plan of the six volumes agrees with that of the new American edition of Gray's 'Anatomy'—beginning at Osteology." Some twenty-five years ago Dr. Benjamin Hobson, then of Canton, prepared an outline of anatomy and physiology in one volume, but to Dr. Osgood belongs the honor of having clothed in the language of the most populous nation of the world one of the best of our modern works on human anatomy. When it is considered that in all past ages the physicians of this vast empire have treated diseases and accidents in profound ignorance of both the structure and function of the parts involved, it will be apparent that Dr. Osgood has conferred on them an inestimable boon in placing within their reach the only real foundation of rational and scientific practice.

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* "Morphia Hypodermically," p. 297.

In the execution of this work Dr. Osgood has had a knowledge of the language acquired by ten years of study and intercourse with the people, and in the practical duties of his profession he has become familiar with such terms as are in common use for the different parts of the body. Nevertheless, the adaptation of terms in such a language as that of China to the nomenclature of a treatise on anatomy is no easy task. The vocabulary in English and Chinese, which makes up a large part of the sixth volume, shows that Dr. Osgood has succeeded most admirably. This was no doubt the most difficult part of his task, for, with names for every organ, and constituent of the organs, the descriptive part could be constructed with comparative ease.

A very important part of the work is the illustrations. It was no doubt a work of much difficulty to get the illustrations so arranged with the new names as to exhibit to the best advantage the structures to be described. We find here the evidence of persevering labor, and it is to be regretted that in printing there has been a failure, in some of the cuts, to bring out the parts clearly and distinctly.

Dr. Osgood had completed ten years of faithful service as a medical missionary, and was just entering upon the period of his life when, with thorough knowledge and enlarged professional experience, combined with familiarity with the language, the customs, and manners of the people, he was prepared for the highest usefulness. Just then the summons of death came, and all those bright hopes were crushed. While his "Anatomy" was in the press, it became necessary for other hands to superintend its completion. Dr. Osgood died suddenly on the 17th of August, 1880. His native place was Nelson, N. H. His medical education was acquired at Brunswick, Maine, and at one of the schools of New York (which one, I do not know), where he received his diploma. He arrived in China in January, 1870, and has devoted his energies to gratuitous practice among all classes of Chinese, but chiefly the poor. In the Medical Missionary Hospital which he established in Foochow, 51,838 patients were attended to in ten years. He also opened an asylum for the cure of persons addicted to the use of opium, and in two years 1,500 opium-smokers were treated.

Thus has passed away, in the vigor of manhood and in the maturity of his faculties, one who was an ornament to his profession, and who in the obscurity of a great heathen city acquired a high degree of skill in both medicine and surgery. This work on anatomy, his hospital, and his good name are the legacies he has left to the Chinese, to the profession, and to the world.

J. G. KERR.

LITTLE'S COMBINED TABLE AND LOUNGE.

60 WEST FORTIETH STREET, NEW YORK, *October* 19, 1881.

Editor of the New York Medical Journal:

DEAR SIR: In a paper on "Rectal Exploration and Diagnosis," published in the October number of your journal, in which the author illustrates a combined table and lounge, no mention is made of the inventor's name. This surprises me very much, as the lounge was invented by me and has been in use in my office for several years. A full description of it was published in the "Medical Record" for July 19, 1879, pp. 70, 71, and it was also exhibited about the same time before the surgical section of the Academy of Medicine. Dr. Kelsey, the author of the paper, visited me and requested the privilege of making a similar lounge, and the measurements were taken; and, if I am not mistaken, his cabinet-maker also called so as to enable him to make an exact copy. The instrument-case represented by Fig. 4 in the same paper is almost an exact copy of one in my office, which I devised about the same time and have used continually since.

Permission was given Dr. Kelsey to publish both lounge and instrument-case in his article, but it was expressly understood that I should have due credit given me as the inventor. Dr. Kelsey has failed to do me this justice. I now claim space in your journal to establish my claims as inventor to both lounge and instrument-case. I would also state that valuable modifications have been made in the combination lounge which make it much more serviceable.

Yours truly, J. L. LITTLE, M. D.

Reports on the Progress of Medicine.

MONTHLY REPORT ON OBSTETRICS AND GYNÆCOLOGY.

No. X.

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OBSTETRICS.

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3, 4. Dr. Braxton Hicks called attention anew, at the late meeting of the International Medical Congress, to *the diagnostic value of intermittent contractions of the gravid uterus:* 1, in suspected extra-uterine pregnancy; 2, in hydramnios, when an ovarian cyst was supposed to exist and paracentesis was performed through the uterine wall; 3, in cases of pregnancy with the supposed coexistence of tumor; 4, in hydramnios with twin conception, etc. He referred to a former publication of his in which he had shown that the gravid uterus usually contracted at intervals of from five to twenty minutes during the whole period of pregnancy, and that these contractions could be recognized readily with the hand. He had lately pointed out also that they were indicated by the gastrograph. ═══ The "Lancet" having remarked that Dr. Hicks had failed to mention in his paper that these contractions were not diagnostic of pregnancy, for they were found to occur in elastic fibroid tumors of the uterus, and a like observation having been made in the discussion on the paper (the author being absent), he rejoins in a letter, stating that he has paid attention to this subject for twelve or thirteen years; that he has never met with these frequent contractions in any other condition of the uterus than that of pregnancy; and that he has never heard of any one who has narrated such an occurrence, although the late Dr. Tanner made an off-hand assertion about it. He admits that a change of density gradually takes place for some days before the "period" in cases of elastic fibroids, but maintains that this change is entirely different from the contractions occurring every five to twenty minutes in pregnancy, and that the latter are a very reliable sign of intra-uterine pregnancy, the only condition at all likely to give rise to error being that of distention of the uterus with retained menses. He has no proof, however, that contractions occur in this state, and, if they do, a vaginal examination will settle the question. The letter closes with the following sentence, the meaning of which we are unable to make out: "Supposing it were hereafter shown that elastic fibroids became altered in density every five to twenty minutes in all cases where amenorrhœa was present, then we may be certain, for these tumors have no such symptoms."

8. M. Bar relates an unusually striking instance of *the influence of pregnancy upon the growth of tumors.* During the early part of gestation a primipara suffered from a dental neuralgia, most marked in the region of the right upper molars. About the close of the sixth month the pain ceased, but at that time, according to the patient's story, a tumor made its appearance at the situation that should have been occupied by the right upper dens sapientiæ. For a fortnight it grew very rapidly, and bled on being touched, a hæmorrhage occurring at every meal and the flow of blood being at times very difficult to stop. The tumor was attached by a short pedicle, and was flattened by contact with the vault of the palate, extending beyond the median line. Its surface was smooth, with shallow furrows in front, and its color was that of the adjacent mucous membrane. It continued to grow up to the time that labor took place. Twelve days after confinement, however, it was found considerably reduced in size, and a month later there was nothing to be seen of it but a little fleshy excrescence, no larger than a small lentil. The tumor was regarded as an epulis of fibro-plastic nature. The author considers the case quite exceptional.

11. Dr. Lazarewitch, in a paper on *the curves of midwifery forceps*, read at the International Medical Congress, maintained that the pelvic curve should be slight if any, as such curvature increased the opposing force, and might give rise to injuries of the soft parts. A forceps without any pelvic curve whatever best answered the mechanical requirements. Very few instruments possessed a perineal curve, because the elasticity of the perinæum allowed of its retraction back to the coccyx without injury. Traction should be directed by the muscular sense of the hands, and not by any special mechanism.

12. Dr. More argues against the routine practice of using *the catheter before forceps-delivery*. It is only in cases of protracted labor, cases that seldom occur nowadays, that distention of the bladder is likely to exist, for the renal secretion is diminished for the time being, the capacity of the bladder is lessened, and the inclination to urinate, and thus partly empty the bladder, is almost invariably a prominent symptom of labor. The paper concludes with the following *résumé:* 1. Distention of the bladder, as a complication of ordinary labor, is very rare. 2. Clinical evidence would seem to indicate that it is rare even in tedious labors. 3. When present it is generally as a symptom of greatly protracted labor. 4. The more frequent and early use of the forceps, by eliminating this complication, does away with the necessity of preliminary catheterism. 5. Distention of the bladder is easily enough recognized without resorting to the disagreeable operation of catheterism. 6. The catheter should not be used empirically, but intelligently, i. e., according to the nature of the individual case, and only where there is accumulation of urine. 7. The operation, being difficult without an amount of exposure repugnant to the patient, becomes a bar to the legitimate and early use of the forceps. 8. The early use of the forceps should not be unnecessarily handicapped by disagreeable and questionable details. The conditions in which the author would consider it necessary to attend specially (by catheter) to the state of the bladder are as follows: 1. The fact of the patient's not having passed water for some time. 2. The existence of a supra-pubic tumor other than the fœtus. 3. Extreme pain during contraction, of a character disproportionate to the expulsive efforts. 4. The sudden cessation of the uterine pains. 5. Protracted labor with or without impaction of the head. 6. The presence of vaginal cystocele. After delivery the following conditions would call for special vigilance: 1. The patient's not having passed water for at least ten or twelve hours after labor. 2. Her inability to do so. 3. The uterine tumor being too high in the abdomen. 4. Pain over the pubes not due to after-pains.

13. Dr. Garrison describes a *barbarous obstetrical operation*, the facts of which, he states, were related to him and vouched for by Dr. A. V. Haigh, a surgeon of prominence and a member of the Board of Medical Examiners for Arkansas County, Arkansas. We reproduce Dr. Garrison's account entire: "Last winter Dr. Haigh was called to see a colored woman who had been delivered of a dead child some hours previous to his arrival, and on being informed that Dr. C. C. Lyon, of Mount Adams, Arkansas, had been in attendance some twelve hours before, and that a surgical operation of some kind had been performed by him on the woman, he immediately dispatched a messenger for Dr. Lyon, who refused to come, and sent his partner, Dr. Van Sant, instead. When Dr. V. arrived Dr. H. requested him to make an examination, which he did, and found the vagina plugged with cotton and the bed saturated with blood. The uterus, vagina, perinæum, and recto-vaginal septum were found to be cleanly divided, the incision extending up the rectum for six inches! The child's right eye was cut out, and a gash extended thence across its face to the opposite ear, cutting its nose in two! The friends of the patient who were present at the time of the operation say that when Dr. Lyon first came he examined the patient and then laid down to sleep. After several hours he was re-awakened, and after reëxamining the patient, asked for a sharp knife. A sharp-pointed 'Barlow' knife was furnished him, which he whetted to a sufficient degree of sharpness, and then proceeded to operate with result as above stated, the child having quickly followed the track of the knife. The patient was moribund when Dr. Haigh arrived. He also informed me that Dr. Lyon fled the country to escape summary justice at the hands of the outraged and indignant negroes. It is a fact well known to several medical gentlemen in this country [county?] that thirty years ago a resident physician living in the county site, having a reputation as a surgeon, was called in consultation to a case of difficult labor, and, with an instrument familiarly known as a butcher-knife, he carved the poor woman's pudenda until, undelivered, death obtained."

15. This case of "*unpremeditated Porro's operation* was one of normal pregnancy mistaken for tubo-ovarian gestation. After removing the fœtus and placenta through an incision into the uterus, the operator actually removed the entire uterus together with the ovaries—still supposing that he was dealing with an extra-uterine sac. The operation was skillfully done, but the woman died on the second day of peritonitis. Up to the time of the autopsy the operator was not aware of what he had done, but was of opinion that he had removed a segment of a malformed uterus. The patient had been examined repeatedly by several surgeons "of no mean skill or experience," all of whom seem to have concurred in the diagnosis.

19. Dr. Gattai relates a case of *vaginal entero-epiplocele formed during labor.* A rather bulky tumor, cylindrical in form and of a deep-red color, protruded from the vulva. It felt elastic on palpation, and on pressure it gave out, especially its intra-vaginal portion, a distinct intestinal gurgling sound. Where the gurgling was heard the tumor was tympanitic, but elsewhere it was dull on percussion. The membranes were intact, the os uteri was well dilated, and a fœtus presented in the left occipito-anterior position. A few grammes of normal urine were withdrawn from the bladder with a catheter, and the rectum was emptied by means of an enema. These measures produced no change in the tumor. Considering it necessary to reduce the hernia before any further advance of the head should take place, the author proceeded to make moderate pressure upon it toward the vault of the vagina, the patient lying supine, with the thighs flexed on the pelvis and the legs on the thighs, the hips resting on a pillow. It was impossible, however, to make the swelling retreat farther than to the ostium vaginæ. An attempt was now made with the patient in the knee-elbow posture. During this manipulation, which failed, the waters broke and the head suddenly entered the excavation. The woman was now made to resume the dorsal decubitus, and, finding that the head was accomplishing its normal movements, the author pressed the tumor with his right index and middle fingers against the upper wall of the vagina. The occiput was soon turned to the pubic arch, and the expulsion of a fœtus was speedily finished. A second fœtus followed in ten minutes, after which the hernia was easily reduced with a characteristic gurgling sound. The convalescence was normal, and the hernia was not reproduced.

21. Dr. Mann's case, illustrating *the treatment of rupture of the uterus by drainage*, was one in which, on account of pelvic abnormality, premature labor was brought on by the introduction of a bougie in what seemed to be the thirty-second week of pregnancy. Bipolar version was attempted an hour and a quarter after the rupture of the membranes, on account of rigidity of the os externum with abnormal retraction of the os internum. The patient having been deeply anæsthetized with chloroform, the head was turned aside and a foot was brought down, but at that moment a powerful uterine contraction—the beginning of a tetanic condition of the uterus—suddenly drove the head down upon the pelvic entrance, so hindering the version that it could be completed only bimanually. The head proved difficult of extraction, great force and repeated tractions (after the manner of Smellie and Veit) being required. The child was still-born. The placenta was removed ten minutes after the birth of the child by slight external pressure. When the arms had been liberated the head could be felt immediately beneath the abdominal wall, and at the same time a furrow was detected, running obliquely from below on the right side upward and to the left. Internal examination showed a transverse rupture of the anterior cervical wall, but its upper extremity could not be reached, nor could it be ascertained whether the rupture was complete or incomplete. There was no hæmatoma or emphysema at any time—the former of which conditions the author speaks of as pathognomonic, stating that he has observed it in most cases of rupture of the uterus, while he has seen the latter, exquisitely pronounced, in two instances. After careful disinfectant irrigation a large drainage tube was inserted in the rent, the vagina was tamponed with carbolized wadding, and an occlusive dressing was fastened to the vulva with a T-bandage. The outer end of the tube was closed by tying a knot in it, and an ice-bag was applied to the abdomen. Good uterine contraction was secured by manipulation, the pressure of the hand assisting the approximation of the edges of the wound by causing marked anteflexion of the uterus. The progress of the case was in the highest degree favorable. The occlusive dressing was renewed as occasion required. Twenty-four hours after labor the drainage tube was opened, giving exit to a quantity of foul sanguinolent fluid, and twelve hours later the tampon was removed. The track of the rupture was gently irrigated through the drainage tube with a lukewarm two-per-cent. solution of carbolic acid twice a day from the second to the fifth day, when the tube was expelled. There was no general peritonitis, but up to the sixteenth day there was more or less severe pain and tenderness on the left side in the vicinity of the injury. The patient sat up on the twenty-fourth day, and was discharged on the thirtieth day, at which time the uterus was in the attitude of right latero-anteversion, movable, free from tenderness, and extending three finger-breadths above the symphysis. The surrounding tissues were perfectly free. On the left side of the cervix there was a laceration extending to the vaginal junction. The cervical canal was open; the os internum was closed. From the latter a furrow, continuous with the open laceration, and with projecting, uneven borders, extended into the left wall of the cervix, gaping sufficiently to admit the tip of the finger.

26. In Dr. Jacob's case of *retention of the placenta after abortion* the fœtus was expelled at about the close of the fourth month of pregnancy, seven months before the patient came under his care. A week after the abortion she had a severe flooding, and on several occasions afterward "lumps of flesh" came away. Ever since her first attack she had suffered with severe pain in the back, and had a sanious discharge. She was blanched, weak, and nervous, and walked with difficulty. The uterus was large, the os was soft, patulous, and somewhat eroded, but would not admit a finger, and there was a non-offensive sanious discharge. On the supposition that the case was one of subinvolution, twenty minims of fluid extract of ergot were ordered three times a day. The third dose was followed by violent pains, and an intact placenta about as large as a fist was expelled. It was somewhat indurated, but did not appear decomposed, and was not offensive. The patient rapidly recovered her strength.

28. Dr. Madden is of the opinion that death from *post-partum hæmorrhage* is generally preventable, and that in the perfect midwifery of the future it will be entirely unknown. Some slight loss of blood is natural, and its importance should not be exaggerated. Where there is reason to anticipate hæmorrhage the membranes should be ruptured as early as possible during labor, so as to allow the uterus to contract gradually and firmly; and a dose of ergotine or a drachm of the fluid extract of ergot should be injected hypodermically before the head comes to press on the perinæum. The prophylactic effect of a course of any astringent preparation of iron during the last months of pregnancy is unquestionable. Hæmorrhage from laceration of the cervix is more common than formerly, owing to abuse of the long curved forceps, which is too often resorted to before full dilatation of the os. The injection of hot water into the uterus is most uncertain in its hæmostatic action, useful only in cases of extreme depression from excessive hæmorrhage, and after the failure of other remedies. Neither is the injection of cold or iced water to be depended upon. The injection of a strong solution of perchloride of iron, although generally effectual, is very hazardous from the risk of causing metro-peritonitis. The author earnestly recommends the introduction of a sponge soaked in a solution of perchloride of iron, to be pressed into the uterus within the grasp of the hand, and left there until firm contraction expels both sponge and hand. Transfusion, as now practiced, is almost useless in the collapse from post-partum hæmorrhage.

Instead, he recommends large hypodermic injections of sulphuric ether.

30. As bearing upon the subject of *secondary post-partum hæmorrhage*, Dr. Hicks read cases in which the whole or a part of the placenta had been retained after delivery at or near term. He urged that, whenever after delivery there were floodings and an offensive discharge, the uterus should be explored.

31. M. Martin suggests the use of *parsley leaves as an antilactescent.* The breasts should be covered with the fresh leaves, which should be renewed as soon as they wither—several times a day. The milk, he says, will speedily disappear. He is uncertain whether the effect is due to the essential oil or to an organic acid in the plant.

35. Dr. Opie argues warmly in favor of *intra-uterine injections after delivery* for the prevention and arrest of septicæmia, and gives notes of twenty-seven cases in which they were used in the Baltimore Maternity Hospital. They should not be relied upon, however, to the exclusion of other measures. The instrument he now uses works on the plan of the nasal douche. The can is made of zinc (as carbolic acid corrodes tin), and holds half a gallon. Six feet of rubber tubing terminate in a hard-rubber stem with a slight catheter-like bend, having a large, bulbous end, with a watering-pot arrangement of the jets. The physician's hand should always guide the stem and realize accurately its position in the uterus. The douche should be given by a slow, continuous current, in large quantity, and repeated every two, three, or four hours, according to the circumstances of the case. If the lochia are completely arrested, or if there is evidence of gangrene, it is well to repeat it every two hours. With the instrument described, there is the least possible danger, the author thinks, of over-distention, of the introduction of air, or of the liquid entering the uterine sinuses. He accepts the principles of Listerism as applicable to midwifery, and thinks it good routine practice to use disinfectant vaginal injections.

37. Dr. Coles thinks that *post-partum atrophy of the uterus* (superinvolution) is not the result, as was maintained by Sir J. Y. Simpson, of an excess in the process of involution, but is always due to a preëxisting inflammation [a cirrhosis, if we understand him aright].

GYNÆCOLOGY.

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2. Dr. Zander's article on *chlorosis* bears particularly upon the matter of treatment. The effects of iron, he remarks, are apt to be transitory—so soon as its administration is suspended the phenomena of the disease reappear. The pathology of the affection lies not so much in a mere deficiency of iron in the blood as in a lowered state of the general nutrition, usually dependent on enfeebled digestion. Treatment founded on this theory has given excellent results in the author's hands. He makes use of hydrochloric acid chiefly, according to the following formula: Hydrochloric acid, 2·0 – 4·0 grammes [$\frac{1}{2}$–1 drachm]; water, 200·0 grammes [about 6$\frac{1}{2}$ ounces]. One or two tablespoonfuls to be taken a quarter of an hour after meals. In a few severe cases he has used pepsin in addition.

4. M. Cayla's case of tuberculo-ulcerative *lupus of the vulva* (esthiomène) was that of a seamstress, forty-two years of age, who was admitted into the Cochin Hospital (service of M. Moutard-Martin) and died on the following day. But little was learned of her antecedents, but it appeared that during childhood she had had glandular abscesses of the neck and eczema, and that she had had one confinement, when she was twenty-five years old. Her health had been good until ten years before her admission, when she began to lose flesh and strength, but coughed only a very little, and had no attacks of hæmoptysis. The decline in strength was gradual and steady. She had always carefully concealed the affection of the vulva, and had always refused to have it examined. Shortly before her admission she was seized with diarrhœa, and began to lose strength fast, with rapid emaciation, cough, and night-sweats. On admission she was found to have cavities in the apices of both lungs. At the autopsy, besides the evidences of advanced pulmonary tuberculosis, the vulva was found considerably swollen, especially the labia majora. Indurated tubercles and ulcerated surfaces were found side by side, chiefly on the inner aspect of the left labium majus. The anus and vagina formed a cloaca, in which, along with violaceous vegetations, depressions were seen, giving the parts an indescribable appearance. A bridle, resembling the adjacent diseased tissue to the sight and touch, stretched between the nates, separating the rectum from the vagina. The lesion had invaded the nymphæ and the vagina to a slight extent. The uterus was healthy. On microscopic examination the tubercles presented all the characters of those of lupus; the connective tissue was infiltrated with embryonal elements.

6. Mr. Wallace's case of *imperforate hymen* is an addition to the number of those in which no harm has followed the immediate relief of menstrual retention by free incision practiced without the advantage of rest in the after-treatment. [It is to be noted that the Fallopian tubes were ascertained to be free from dilatation, although the uterus had reached a height of three inches above the symphysis pubis; also that the free incision was not made until about thirty-six ounces of the pent-up blood had drained away through a preliminary puncture.]

8. Under the title of *partial resection of the vagina for prolapse of the uterus*, Fritsch describes an operation that he has done in several cases, in which the whole thickness of the posterior vaginal wall is removed. This results in a firm cicatrix that does not give way subsequently. The posterior wall of the vagina is seized with a forceps and dragged forcibly downward and forward. While an assistant holds the forceps the operator applies a clamp to the redundant wall of the vagina, crowding as much tissue into it as possible by manipulating with a finger in the rectum. The fold of tissue is smoothed out as the clamp is closed. Then a few sutures are inserted beneath the clamp, the finger in the rectum guiding them deep, and the mass of vaginal wall is cut off above the clamp with a stroke of the knife. On removing the clamp the wound gapes wide, several arteries spurt, and in the depths of the wound the rectum is seen. On bringing its edges together the wound is six or seven centimetres long. It is rapidly closed with three deep sutures and from six to eight superficial ones, the latter including those tha

were passed under the clamp. After-treatment is unnecessary. In three cases the result was as follows: The lower part of the vagina was narrowed, but this did not show externally; the scar had retreated notably from the empty rectum; that portion of the vagina situated above the cicatrix was like a wide pocket. In two of these cases a retroflexion had developed at the end of three months, acting as a perfect bar to any further prolapse. In the third case the vaginal portion of the cervix remained above the cicatrix. A remarkable approximation of the lower part of the vagina to the symphysis pubis was observed. Although the bleeding is free, the operation is done so speedily that less blood is lost than in colporrhaphy or colpo-perinæorrhaphy. With antisepsis, an opening into Douglas's space is devoid of danger [!].

11. Dr. Potter relates the case of a woman who, having passed a menstrual period without the occurrence of a flow, gave herself, as she supposed, an *intra-uterine injection of vinegar* for the purpose of producing abortion. Intense pain in the lower part of the abdomen was the result, with vomiting and prostration. Hot applications and the free use of opium were soon followed by reaction and relief, and no inflammatory affection supervened.

12. Dr. Mastin's article is written to correct an impression that he had proclaimed *polypodium incanum as an emmenagogue.* He expresses his intention to test the matter, however, his attention having been drawn to this supposed property of the plant (a parasite of like habitat with the viscum album) by its popularity as an abortifacient among the negroes of central Alabama.

14. Dr. Bennet remarked at the International Medical Congress that, with regard to the frequency of *laceration of the cervix uteri* during labor, he quite agreed with Dr. Emmet, Dr. Pallen, and others, but that its principal cause was previous inflammation and induration of the cervix, causing rigidity at the time of labor. He had attended many hundred cases of laceration, slight and severe, without once operating. The inflammatory state having been attended to, the ulcerated edges always healed, the indurated tissues softened, and a mere notch remained. He had never seen uncontrollable hæmorrhage from this cause n subsequent labors, or extension of the laceration to the body of the uterus. He thought the necessity for trachelorrhaphy was extremely rare.

15. MM. Terrillon and Lermoyez give a fair summary of the American doctrines in regard to *laceration of the cervix uteri*, although marred by occasional slips, such, for instance, as an allusion to a lively discussion "*entre Montrose et Pallen.*" The authors do not agree with Dr. Pallen that the operation is indicated for the control of hæmorrhage after delivery. They seem to look upon eversion as the main element in the morbid train of events following the lesion. The practice (which they impute to Dr. Skene) of allowing patients to go about their occupation immediately after the operation they regard as bad. They meet American enthusiasm with some reserve, inclining rather to Schröder's views of the matter, but confess that Emmet's operation seems rational enough, and are disposed to think that it may become general in the future.

19. Dr. Arning tabulates twenty-one cases in which Dr. A. Martin has performed Emmet's operation for *laceration of the cervix uteri.* The following data appear in the table: The patient's age; the age at which menstruation began, and its character before and after the operation; the duration of the symptoms; the previous treatment; the symptoms and diagnosis; the date of the operation; the state of the cervix after the operation, together with the character of the patient's convalescence; the effect upon the patient's condition, etc. In one instance union failed to take place. The lesion was complicated with chronic parametritis, which, however, was not aggravated by the operation, although acute inflammation of the right ovary followed some months afterward, the laceration having been on the left side. In another case only the upper two thirds of the laceration healed, but it was an "ambulant" case. In almost all the cases marked amelioration of the symptoms was noted. Tenderness or slight infiltration about the vault of the vagina does not contraindicate the performance of the operation, but is rather benefited by it, Martin thinks; and, like Breisky, Schröder, and Spiegelberg, he does not regard a prolonged preparatory treatment as necessary. Fresh lacerations should be sewed up at once if they give rise to notable hæmorrhage, and also in order not to allow of the continuance of any factor likely to interfere with involution. If they are not discovered until some time has clapsed, it is better to wait for cicatrization; but as soon as signs of irritation appear, such as arrested involution, profuse hæmorrhages, an incipient endometritis, or tenderness of the adnexa, the laceration should be closed at once. In old women, in the absence of inflammatory phenomena, the operation is not called for, unless there is reason to think that the traction or pressure of the cicatricial tissue is at the bottom of the subjective symptoms; in young women, on the contrary, a deep laceration should be closed under all circumstances.

21. Dr. Goldschmidt defines the four following *types of uterine catarrh:* (1) with a moderately abundant, glutinous, cloudy, flaky discharge; (2) with an exceedingly offensive, very profuse, watery discharge swarming with bacteria; (3) with an abundant, purulent discharge; (4) with a discharge of normal-looking mucus, clear and glassy, but excessively copious. The great lack of uniformity in the results of various plans of treatment he attributes to a failure to discriminate between these several types of the discharge.

22. M. Guéneau de Mussy gives a case showing, as he thinks, the great utility of *iodized-cotton tampons for engorgement of the uterus.* [The idea certainly can not be called novel, but it must be confessed that the author displays originality in speaking of this method of using iodine as "*fumigations iodées.*"]

24. Dr. Coghill's paper on *the mechanical treatment of uterine displacements and flexions* is a plea for that sort of treatment and for the doctrine that such lesions are of great importance. The author justly deprecates unreasoning partisanship upon this question, and expresses his own views very temperately. He upholds the practice of replacement with the sound, and thinks stem pessaries as inoffensive in the uterus as a dentist's plate is in the mouth, if used judiciously. At the same time he admits that much harm has been done by such measures in the practice of those whose acquirements are deficient. Pessaries with external support are, he thinks, "now mostly and very properly relegated to gynæcological museums." ═══ The discussion that followed the reading of the paper, at the recent meeting of the British Medical Association, showed that those present agreed with the speaker in the main. Dr. Nelson, of Chicago [whose remarks we would particularly commend], spoke of uterine displacements as being probably more a sign than a disease, and urged that in all cases special attention should be given to the structures surrounding the uterus. Parametritis was an important matter to be attended to. This having been done, the mechanical support should be used, but should be discontinued at once if it did any harm. The situation of the ovaries was to be watched; they must not come in the way of the pessary.

26. *Adaptable pessaries of "Godiva"* ("a composition made for dental purposes") were shown and described by Dr. Reid at the recent meeting of the British Medical Association. The material was admitted to be brittle, so that in some cases a wire frame would be advisable; but the speaker claimed that the brittleness was not a disadvantage, and that when the ring of substance was perfect the arch had great strength. [From the account, "Godiva" would seem to be decidedly inferior to the celluloid-coated copper wire recommended by Dr. W. M. Chamberlain at a meeting of the New York Obstetrical Society (see this journal for January, 1881, p. 105). From a considerable experience with this material we can say that it answers the purpose admirably, losing neither its high polish nor its pliability after months of continuous use.]

27. Of all *anteversion pessaries*, M. Thévenot prefers that of Graily Hewitt, especially when there is no descent of the uterus. When there is such descent a Hodge pessary will in many cases so raise and steady the organ as to give relief. On this account, and because the latter instrument is usually much better borne than the former, physicians often content themselves with inserting a Hodge pessary. In regard to the curability of anteversion, it is well to remove the pessary every two or three months, and observe how long the uterus will maintain its proper posture without its support. If it does so for some weeks or months, we may infer that a coil of intestine has dropped down to support it, and a permanent cure may be hoped for. Some cases do very well with the aid of the pessary, for a few days or weeks at a time, at long intervals.

29. Dr. Atthill doubts the correctness of the view commonly held that *inversion of the uterus* occurs in the very large majority of cases immediately after delivery. Of five cases that have come under his own observation only two occurred after delivery. In the three others it was due to a fibrous tumor attached to the fundus. In each of them the tumor was sessile, and was attached nearly at the center of the fundus. In cases of inversion coming on immediately on the conclusion of the second stage of labor, with the placenta adherent, it is invariably to the very fundus that the placenta is attached. In all cases, then, a body, to all intents a foreign body, is attached to the fundus. The weight of a tumor or traction on the funis may be a minor factor in exceptional cases, but they are quite insufficient to account for the result. The weakness of the uterine wall at the site of the placenta makes its depression, *when the placenta is detached*, possible, but not probable; but when the organ is adherent, thus giving support to the uterine wall, it is extremely unlikely that such weakness should be the cause of the accident. The inversion frequently—and in the author's opinion probably always—must at least begin before the placenta is separated from its attachment. Likewise, in cases of tumor, any weakness from thinning of the fundus would have little effect; moreover, such thinning of the fundus is far from being proved. A further cause is therefore requisite, and that cause is the occurrence of expulsive uterine contractions, which are most likely to take place when the tumor is attached to the fundus, the most irritable part of the organ. In the case of the placenta this explanation is not open to the objection that, if true, inversion ought to occur frequently, for the author denies that the "fundal zone" of Barnes is "the most natural position" for the attachment of the placenta—indeed, he has never found it attached centrally to the fundus whenever he has had to introduce his hand to remove it on account of adhesion. He wholly rejects the theory advanced by Rokitansky, and adopted by Barnes, that paralysis occurs at the placental site; it is, rather, abnormal activity of the muscular fibers that is the distinctive feature. The symptoms of inversion at the time of its production are, he thinks, seldom marked by anything special. He agrees with Aveling and White in thinking that the reduction of a chronic inversion may almost always be accomplished. Aveling's instrument may answer very well for particular cases, but if the fundus is large he prefers White's. In exceptional cases amputation is more to be recommended, however, and is not so dangerous a procedure as is generally supposed. The preliminary ligation of the cervix twenty-four hours beforehand, as suggested by M'Clintock, is very painful and wholly unnecessary. A case is given in which amputation was successfully done after several futile attempts at reduction.

30. Dr. Macdonald relates two cases of chronic *inversion of the uterus* in which reduction was attempted. It was accomplished successfully in one instance, but in the other case the cervical wall gave way, and the bulk of the organ [still inverted, we infer] passed through the rent into the peritoneal cavity. With great difficulty it was drawn back into the vagina again, and amputated. The author states that there was "no slip of the instrument, no sense of sudden giving way of parts." A wire écraseur was passed round the uterus as near as possible at the junction of the cervix with the body, but before the separation was completed the instrument broke, and the amputation was finished with scissors, dividing first one broad ligament, and then the other. Connected with each there was found a vessel nearly as large as the radial artery. In view of the difficulty of securing such vessels by ordinary ligature, and mindful of a case of fatal bleeding into the peritoneal cavity from the Fallopian tube, owing to retraction of the separated broad ligaments, the operator passed a needle carrying a silver wire from the vaginal aspect of the inverted cervix to the peritoneal aspect, and brought it back again in such a way as to include the vessel and the end of the Fallopian tube in the loop. This was carefully twisted tight, and cut rather short. A drainage tube was passed through the cavity of the cervix, and fixed in position by a stitch to the left labium majus. The patient made a good recovery.

31. At the recent session of the International Medical Congress, Dr. Freund reviewed the history of various operations for *extirpation of the uterus*, especially the one brought forward by himself, and admitted that greater safety to life, according to the most recent experience, was secured by the *per-vaginam* method, as practiced by Czerny, Billroth, Schröder, and Martin, and the abdominal method modified according to the directions of Bardenheuer, Breisky, Rydygier, Kolaczek, and M. B. Freund. Rydygier and himself had carried out Breisky's idea of first separating the cervix from the vault of the vagina, after which it was easy to draw the uterus up through the abdominal wound above the symphysis by means of the tenaculum-forceps, and the organ was thus at once made comparatively bloodless. This severing of the cervix he had done before anæsthetizing the patient. The vaginal method appeared to give very good results, and the abdominal operation, as practiced by Kolaczek and Martini, was not a very dangerous one, and, if undertaken in the early stage of the disease, gave promise of a radical cure. The abdominal method should always be undertaken when the uterus was very large and the vagina very narrow, while with a small uterus and a capacious vagina the vaginal operation was to be preferred. The former had the advantage of insuring the removal of all the diseased tissue. The danger of bleeding was not so great as was once supposed, and it was highly desirable to keep the peritoneal wound open. ═══ Dr. Martin, of Berlin, said he had performed the operation in six cases, all of which proved fatal. He thought that any cancerous infection of the broad ligaments or the neighboring lymphatics rendered it useless. ═══ Mr. Spencer Wells had not removed the entire uterus for cancer, and had never seen a case in which so serious an operation seemed justifiable. In the vaginal operation hæmorrhage might be controlled by a number of pressure-forceps until all fear of bleeding was over.

41. M. Terrier gives a critical review of *the results of the incomplete removal of ovarian cysts*, and reaches the following conclusions: 1. Laying the cyst open, stitching its walls to the abdominal wound, and maintaining drainage give very different results, according to the nature of the tumor. 2. If the cyst is unilocular, like serous cysts of the broad ligament and dermoid cysts, the result may be excellent, the cystic cavity disappearing entirely in the end. 3. Perhaps the same may be accomplished with certain cysts that, from a clinical point of view, appear to be unilocular, but which a pathological anatomist would consider multilocular. 4. When the cyst is multilocular, and when there are vegetations on its walls, the results are but very indifferent. The tumor has a constant tendency to grow again, the abdominal fistula persists indefinitely, and the interminable suppuration exposes to chronic septicæmia and exhaustion. 5. We must take into account, with both unilocular and multilocular cysts, the possibility of the rapid development of a preëxisting tumor of the other ovary, the state of which it was not possible to ascertain at the time of the operation.

42. At the recent session of the International Medical Congress Dr. Battey characterized *Battey's operation* as a *dernier ressort*, not as an ordinary alternative for other measures. It had been claimed for the vaginal method of operating: (*a*) that the mortality was less; (*b*) that it favored perfect drainage; (*c*) that air was admitted to the peritoneal cavity in but slight degree; (*d*) that the intestinal mass was but little exposed to mechanical irritation. With all these advantages, however, it should not be done in preference to the abdominal operation unless the accessibility of the ovaries and absence of adhesions were well assured. The pedicle was almost always treated with a ligature cut short, but in thirteen cases he had used the écraseur alone, and in none of them had troublesome hæmorrhage occurred. In the cases collected the death rate had been 22 per cent. for complete, and 9½ per cent. for incomplete cases. Menstruation after the removal of both ovaries was exceptional, but in his experience it invariably occurred if even small fragments of the ovaries were left. In several cases in which the results were unsatisfactory for some months there was great subsequent improvement, and in a few of them a complete cure. ═══ Dr. Savage, of Birmingham, reported thirty consecutive successful operations, including ten for chronic and painful prolapse of the ovary, and four for myoma. A large field was open for the operation in properly-selected cases of these affections, he thought, but as to so-called ovarian dysmenorrhœa, there was considerable difficulty in coming to a conclusion as to the cases in which it would be likely to be suitable.

QUARTERLY REPORT ON SURGERY.

No. VIII.

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11. Dr. Macphail's study of *carbolic-acid poisoning in surgical practice* contains much that is interesting. He holds that at the outset of a case treated antiseptically there is not much danger in using an excess of carbolic acid, for at this stage the hyperæmia so caused is rather an advantage, as it tends to promote primary union. It is in the subsequent treatment that the direct contact of the carbolic acid must, as far as possible, be avoided, for it must be remembered that a very weak solution is sufficient to keep a wound once thoroughly aseptic from suppuration. A favorite practice with those whose zeal is greater than their knowledge consists in frequent dressings or syringings of the wound. Great surprise is shown when suppuration and probably pyæmia are produced by following out this course, and a reproach is cast upon the antiseptic system. They forget that the practice implies a theory, and that this over-zeal in the use of the means is the cause of the hyperæmia and suppuration, the very things the theory seeks to avoid. Especially is the daily syringing of the wound to be avoided as long as it remains aseptic, for it completely prevents one of the great triumphs of the antiseptic system—the non-suppurative organization and cicatrization of the blood-clot. Besides, it complicates the treatment of the case by setting up what Professor Lister has termed "antiseptic suppuration," thus rendering the perfect drainage of the wound more difficult. It means, in fact, converting the primary and preventive use of the drainage-tube in antiseptic surgery into the secondary drains for which they were originally intended by Chassaignac, who introduced them into practice for the escape of matter already formed in a wound. The literature of the subject of poisoning from carbolic-acid dressings is very meager, coming chiefly from German authors, and notably from Dr. Küster, of Berlin. Even the German writers are not agreed among themselves as to the real character of the cases they have described, and Dr. Maas, of Freiburg, suspects, from the fact that a high temperature occurred in the cases, that what was set down as carbolic poisoning was in reality, in a good many cases, septicæmia. To use antiseptic treatment does not insure exemption from septic blood-poisoning. But, going on the assumption that the use of antiseptics gives immunity from septicæmia, one is apt to attribute dangerous symptoms to some other cause, and the favorites are carbolic poisoning and fatty embolism. At the discussion on antiseptics at the Metropolitan Counties Branch of the British Medical Association, Mr. Macnamara made some interesting observations on the subject of septic blood-poisoning. While admitting that pyæmia and septicæmia sometimes went hand in hand, he thought that they had no necessary relation to each other, for septicæmia depends on changes in the blood which sometimes occur independently of the atmosphere. Therefore a proportion of such dangerous symptoms occurring in the course of the antiseptic treatment may be eliminated, for, he says, "similar symptoms occur, for instance, from a person receiving a blow on the head with no external injury, but septicæmia is set up in consequence of injury to the dura mater or to the inner table of the skull." We must, therefore, carefully discriminate between such cases and those in which the use of carbolic acid is to blame. In a certain small percentage of hospital antiseptic cases, without any assignable cause, there occurs a rise of temperature—as much as three or four degrees Fahrenheit, due to what Volkmann calls "aseptic fever." Here, with a temperature over 100°, there is no other manifestation of constitutional disturbance; the patient does well, and the progress and aseptic condition of the wound are not interfered with. This is probably a toxic effect of carbolic acid, and may be classed under the minor degrees of the affection under consideration. Again, mere darkness of the urine as the result of carbolic acid, though undoubtedly a warning to the surgeon to be on his guard, is in itself a matter of no moment. The author has seen more than one case progress favorably to convalescence with dark, smoky urine; but, no other symptom having supervened, the changing of the dressings and substitution of some other material was not necessitated. The use of dressings containing carbolic acid sometimes produces a form of eczema or erythema from their continued application, the effect being produced on some in a much shorter time than on others, owing to special susceptibility of the skin. Here, however, the condition is aggravated if not caused by the paraffin contained in the gauze; so it is quite possible that the acid is only partially responsible for this form of irritation. The toxic effect of the acid may occur in a certain small number of cases in spite of the best management; but in such cases it is the result of a rare idiosyncrasy in those affected. Several interesting cases are cited in proof of this statement. One in particular, from the practice of Dr. Whiteford, which shows the peculiar susceptibility the members of some families possess, and also the small quantity which will sometimes suffice to excite symptoms of poisoning. Two children of one family came under his care, suffering from ringworm of the scalp. The treatment in both cases was a two-and-a-half-per-cent. solution of carbolic acid applied to the affected surface in the form of water dressing. In both symptoms of poisoning occurred, in the one case exceedingly severe and coming on very shortly after the first application, while in the other the symptoms were delayed for two days, and were altogether less severe. Removal of the exciting cause removed all the symptoms in both cases. To satisfy his mind that the acid was really at fault, and that the symptoms were not merely a coincidence, he repeated the experiment twice in each case—once to the scalp as before, and again to another part of the body—with the result of bringing back the urinary and gastric disturbances and the other symptoms of carbolic irritation. In none of these applications did the size of the portion of the skin in contact with the acid exceed that of a crown piece. As to the condition of the urine and its peculiar coloration, the only theory advanced is that it is due to the coloring matter of the blood escaping in the shape of an increased amount of indicin. Carbolic acid is quickly eliminated by the kidneys, and in some of the fatal cases this has been found to have been done at the expense of a great deal of irritation and congestion of the organ. The theory that the urine ceases to contain sulphates is brought forward by Vulpius, and to demonstrate their absence he advises the chloride-of-barium test in suspected cases. The sulphuric-acid test is the ordinary one; while discriminating the presence of carbolic acid in the urine by the sense of smell is sometimes of value, though too much stress should not be placed upon it. The only two substitutes for carbolic acid that have been prominently advocated as open to none of the objections we have been discussing are acetate of aluminium and eucalyptus globulus. A year or two ago Maas, of Freiburg, on account of the poisonous properties of carbolic acid and its volatility, introduced a fifteen-per-cent. solution of acetate of aluminium as a cheap and efficacious agent for antiseptic dressings, and possessed of the additional advantage of inducing no toxic effects. Though it has not been much used, the great objection to it is that it can be used only in the liquid form, and is useless as one of the component parts of any antiseptic dressing, for in a dry state it decomposes and acetic acid is set free. To Mr. Lister we are indebted for the introduction of the eucalyptus globulus. At a recent debate at the London Clinical Society he recognized the necessity of being possessed of a suitable material to employ in those cases where grave symptoms occurred from carbolic acid. This agent, he says, he has found by experiment to be a perfect antiseptic and quite free from any unpleasant results, owing to its bland and unirritating qualities. It can not, however, be used as a lotion, as the oil of eucalyptus does not mix with water; but he has prepared a gauze by a process similar to that by which carbolic gauze is prepared, in the proportion of one part of the oil to three, each, of paraffin and damar gum.

16. For the benefit of those of our readers who are not familiar with the instrument, we publish the following short description of *the Hughes induction-balance*, which has recently been employed for locating the bullet in the body of the President. An induction-balance was constructed in which one pair of coils were fixed at a definite and unvariable distance apart by being wound on a double bobbin or spool, being separated from one another by the thickness of the middle flange; and the four free ends of the two coils were made into a cable, by which the two coils constituting the searching apparatus were connected to the battery, telephone, and rheophone; and with a second pair of coils, which formed the indicating apparatus. From the construction of the induction-balance it follows that by varying the distance of the adjustable coils of the indicating apparatus, until the induction currents in the apparatus are balanced or neutralized, silence in the telephone is produced as long as there is no outside disturbing metallic body within the range of induction of the searching instrument. The moment such is the case the compensation is destroyed and the sound is brought back in the telephone, becoming louder or less audible as the disturbing body is nearer or farther from the pair of searching coils. By passing such an apparatus over that part of the body in which a bullet is known to be, an ear placed at the telephone can immediately detect the sounds becoming louder when the foreign body is exercising its maximum inductive effect upon the balance; and, as it is a fact that for equal distances the maximum disturbance is produced when the metallic body lies in the axis of the coils, it will be seen at once that not only the distance of the bullet from the surface of the body, but also its direction from any one spot, can be ascertained with extreme accuracy, and, by repeating the operation on different parts of the region under examination, a number of distances from the surface are obtained as well as a number of lines of direction, all of which have a common origin in the bullet. By this simple arrangement the surgeons in attendance on the President supposed that they were able to verify the position of the ball, but the autopsy shows that they were deceived.

29. After referring to *the relation between diseases of the throat and nose and those of the ear*, Mr. Barr calls particular attention to the so-called adenoid vegetations of the upper pharynx. Meyer, of Copenhagen, Guye, of Amsterdam, and Loewenberg, of Paris, have each made important contributions to this subject. The mucous membrane of the naso-pharynx is very rich in mucous glands, and, besides these, Luschka has described a mass of glandular tissue, which he has named the pharyngeal tonsil, found chiefly in the roof of the pharynx, and which also extends from the roof along the posterior and lateral walls, in the fossa of Rosenmüller, and over the mouths of the Eustachian tubes. The so-called adenoid vegetations consist of an exuberant growth or hypertrophy of this adenoid tissue, and appear in the form of tongue-shaped, globular, or flat excrescences, chiefly on the posterior-superior wall, from which, however, they not unfrequently extend to the posterior nares, where they interfere with the due permeability of the nasal passages. The pharyngeal mouths of the Eustachian tubes are often completely veiled by the mass of growth. Meyer found that seven and a half per cent. of persons who consulted him with affections of the ear suffered from this morbid state of the naso-pharynx. In connection with and dependent on this morbid condition, the ear is variously affected; sometimes with purulent disease, again with simple catarrh resulting from or maintained by these morbid growths. Disease in the ear may be caused by these vegetations in various ways: 1. By their encroaching upon the pharyngeal mouth of the tube and bringing about mechanical closure. 2. By the concomitant inflammation of the mucous membrane of the Eustachian tube, producing swelling and thickening with more or less secretion. 3. By the extension of that inflammation to the mucous membrane of the tympanum, or even to the mastoid cells. 4. Through interference with the nasal breathing. When the nasal passages are markedly obstructed, a rarefaction of the air in the tympanic cavity is produced by every act of swallowing, just as in Toynbee's experiment, and the tympanic membrane with the ossicular chain is forced inward to an abnormal degree. Or obstruction to the nasal passage may induce mischief in the ear by causing sudden abnormal condensations of the air in the tympanum. Under the influence of vehement expiratory acts, as coughing, blowing the nose, sneezing, etc., the air, unable to find its way through the nasal passages, may pass through the Eustachian tubes, with the effect of damaging the middle ear. The treatment of these adenoid vegetations is therefore of very great importance, for its effects not only on the ear, but also on the general health. The author has found digital examination and the treatment of the growths with the finger-nail very useful. By this mode of examination a very clear idea of the condition of the parts can generally be obtained. It is a mistake to judge of the condition of the upper pharyngeal space from the appearance of the back of the pharynx. The latter may appear almost normal, and yet the naso-pharynx be involved in important morbid changes. The method of removing these vegetations by means of the finger-nail is due to Guye, of Amsterdam, and is the least painful and safest mode of operating. It can be used in children, who are much the most subject to these growths, where the use of instruments would be impossible.

61. Mr. Croft, in calling attention to his practice of immediately putting up *simple fractures of the leg* in plaster splints, which allow a view of the fractured part, seems to have fallen upon a plan of treatment which was introduced into American practice by Dr. J. L. Little a long time ago, and has held its place ever since. The practice is undoubtedly good, but we had supposed everybody knew it was good before.

74. M. Ollier considers the whole question of *exsection of the hip joint* from three different standpoints : 1. From the ground of certain experimental researches on the growth of the lower extremity after excision of the joint, and of the formation of the new joint. 2. From a comparison of the results obtained by immobility and drainage with the results obtained by resection, from the triple point of view of length of treatment, preservation of life, and the usefulness of the limb. 3. A description of a new method of operation, serving at the same time for subtrochanteric resection and for decapitation of the femur. His study is very exhaustive, and the conclusions reached are the following: 1. Resection of the hip joint is one of the great triumphs of modern surgery, and the lack of success which followed the early operations in France proves nothing against it. Practiced according to rational indications in infants suffering from suppurative coxalgia, it often gives very happy results in preserving life. The antiseptic method has considerably decreased its dangers; but in the proper appreciation of its gravity it should not be forgotten that in applying it to grave cases of progressive disease, which tend naturally to end fatally, the operation should not be held accountable for the cases it has been unable to cure. Rather should it be judged by the patients it has saved. 2. Statistics taken in mass with regard to mortality are of no value. The great mortality in France during the past twenty years is due to the fact that only the worst cases have been selected for operation; while the better statistics of other countries indicate that the operation has been undertaken in cases where immobilization and drainage might still have succeeded. It is this different appreciation of the indications for the operation which renders the comparison of different series of operations so difficult. 3. From the point of view of the ultimate growth of the limb and of functional result, the value of the operation has heretofore been differently appreciated, in spite of the great number of operations comprised in statistical tables. Careless measurements and hasty observations have led to confusion on this point. 4. The arrest of development which follows exsection of the hip joint is proportionate to the importance of the cartilages sacrificed in the operation, and to the alteration of the nutrition of the member due to the primary lesion and to the loss of function which it entails. In this latter point of view the arrest of development should not be attributed to the operation when the latter has for its end and result the disappearance of the cause which interferes with the general nutrition of the member. 5. The femur, like all the large bones of the limbs, does not develop equally by its two extremities. The development by the lower extremity is about double that by the upper; that is to say, it increases two centimetres by the lower end for each centimetre by the upper. This proportion, although only approximative, is in accordance with all the facts of observations and experiment which are of any service in determining the growth of the bone. This relation of one to two between the two cartilages of the bone is not constant during the whole period of growth. It represents the growth in adult life, but in childhood the femur grows more rapidly at the upper epiphysis. Until the age of four or five years the development is about equal at the two extremities. After the fifth year the development by the upper extremity becomes less rapid in proportion to the lower, and from the age of four to the end of growth the femur gains three centimetres at the lower end for each centimetre at the upper. 6. The removal of the cartilage of the upper end of the bone under the age of four years exposes the femur to an arrest of development of about nine centimetres by the single fact of the removal of the physiological elements of growth and length. To this cause of arrest in development must also be added the general atrophy of the bones of the limb and the loss which results from resection of the diaphysis when care has not been taken to preserve the synovial sheath. 7. The articular cartilage of the head of the femur is the only one of the cartilages of the superior extremity of the bone which serves for an increase in the length of the bone. The *useful length* of the femur is meaured by the distance which separates the highest point of the head from the inferior bicondyloid plane. The continuation in growth in length by the sub-trochanteric cartilage, after decapitation of the femur, does not compensate for the arrest in growth by the femoral neck. The sub-trochanteric cartilage furnishes the growth for the shaft of the bone, or at least for the external branch of bifurcation of the diaphysis; therefore, in spite of removal of the head and neck, a resected femur may appear as long as the sound one if measured from the top of the trochanter to the lower border of the external condyle. But this length of the external border does not represent the useful length of the femur. In spite of the almost equal length of two femora measured by their external borders, the member operated upon may in reality be shortened several inches from the ascent of the bone on to the pelvis. 8. After exsection of the joint it is possible to form a very movable and at the same time solid articulation between the femur and the pelvis. But the type of the articulation is completely changed. In place of a head turning in a cavity, the superior extremity of the femur is joined to the pelvis by solid, fibrous, and yet more or less supple bands, in such a way that in walking the femur tends always to ascend and the pelvis to descend. 9. The sub-periosteal method furnishes the only means which contribute to the formation of an articulation at the same time solid and movable. By reason of the abundance of the circumarticular fibrous products, the chances of anchylosis are, other things being equal, greater after resection by the sub-periosteal than by the old method. 10. The arrest of development caused by resection may be compensated for by inclination of the pelvis to the side operated upon. This compensation may make the two limbs seem equal when in reality there is a shortening of seven or eight centimetres. The possibility of obtaining this lowering of the pelvis by a well-directed subsequent treatment neutralizes in great part the inconveniences of resection from the point of view of the ulterior development of the limb. 11. In spite of the good results which may be obtained orthopædically and functionally by resection of the joint, especially when the operation is done before the appearance of irreparable disorders in the bones and soft tissues, it should only be practiced on very precise indications, and after a trial of all the resources of expectant treatment—punctures, incisions, antiseptic drainage, immobilization, etc. 12. The cases in which resection should be resorted to at the beginning are very rare, and the antiseptic dressings greatly increase the chances of success of the preliminary operations. But resection should be resorted to when the disease becomes more aggravated, in spite of antiseptic incisions and drainage. 13. It is difficult to take into account *a priori* the origin, whether osseous or articular, of coxalgia; but, although in children the affection is most often primarily osseous, and would seem on this account particularly fitted for resection, a cure may be obtained in most of the infantile cases by the expectant method aided by hygienic measures. But resection, which removes at a single blow the tubercular centers of bony origin, is, in cases which have no tendency toward cure, the surest means of ending the suppuration and preventing general tubercular infection. 14. The results of the operation will be found to be more beautiful in an orthopædic and functional light, and to approach nearer to those which are obtained by experimentation on the lower animals, the earlier the operation is practiced. Under these conditions a good solid and movable articulation may be hoped for. 15. Although we may always, by a well-conceived operation and a well-directed after-treatment, obtain a movable articulation, we should not always seek this result. In the conditions in which the operation is most often performed it is preferable to have an osseous anchylosis in a good position, as the patient is obliged to gain his living by work. With such anchylosis the limb is generally more useful than when movable, and is less exposed to a return of the disease. Resections for injuries and for acute suppurative arthritis of recent occurrence, where the disease is limited, will give, without doubt, all that this well-ordered method permits us to hope for; but, with the bones profoundly altered and surrounded by diseased soft parts, most often imperfect articulations will be obtained, exposed to new attacks of inflammation under the influence of pressure and repeated movements. After resections, as after coxalgia which has lasted a long time, osseous or firm fibrous anchylosis will be the surest means of obtaining a radical cure, or at least a definite cessation of the accidents.

75. Mr. Stokes, in discussing the question of *excision of the knee in early life*, alluded to the different views entertained as to the value of excision, and to the importance of distinguishing between the cases suitable for this operation and those requiring amputation, it not being right, in his opinion, to regard excision as a substitute for amputation. He stated that in his experience the majority of cases requiring resection in early life were those in which the terms granular, gelatinous, or pulpy thickening of the mucous membrane had been applied. This condition, as a rule, was the sequel either of a traumatism or of a low form of inflammation coming on without assignable cause, and was the visible sign or outcome of what for lack of a better term was known as struma, scrofula, or the tubercular diathesis. He had had large opportunity for studying this disease, which, when once firmly established, he had found wholly unamenable to expectant treatment, and which was in fact but the first act in the drama whose termination, as a rule, was destruction of the joint. If the morbid action had advanced much beyond the synovial limit, and had extensively implicated the other soft structures of the joint, and if caries also were present, the chances of success after resection were greatly diminished; and although the wound might heal without suppuration, and the results appear admirable when the patient left the hospital, yet he had seen examples of the return of caries ten or twelve months afterward, leading to abscesses and the necessity for amputation. This course of events he had never witnessed when the operation was undertaken at an early period of the disease. He dissented entirely from the view that in these cases the requirements of resection were fulfilled by incision, injection, and drainage of the joint; for, even if the well-known risks of suppuration in the joint were perchance avoided by this procedure, the ultimate condition was no better than it would have been had resection been performed. Nor did his experience lead him to agree with those who found an objection to resection in the subsequent atrophy or shortening of the limb. The explanation of this lay in the very fact that the operation was done at an early stage of the disease, when it was necessary to remove only a very thin slice of the articular ends of the bone; and the osteogenetic function of the epiphysis was therefore practically not interfered with. In none of the cases which suggested his remarks had he seen either atrophy or deformity. He referred to the faulty methods of dressing formerly in use, and even now not altogether abandoned, after excision, and described that which he himself employed. Listerian precautions were invariably followed, and the limb was fixed at absolute rest by two metallic splints, one on the anterior and the other on the posterior surface, and retained there by gypsum bandages. The absolute immobility thus secured conduced to the early healing of the wound, and he rarely found more than three or four dressings necessary. He alluded to an accident met with in two or three cases, namely, hæmorrhage coming on some hours after the operation, and not from any visible vessel, but from the cut surface of the bone. He thought it possible this might be due to the use of the elastic bandage, and referred to the experience of the Leeds surgeons, who, he learned, had met with the same accident occasionally, and had abandoned the use of the elastic bandage.

88. Mr. Annandale contributes several interesting points of practical value to *the surgery of the œsophagus.* He has learned by experience to expect resistance to the passage of a bougie in cases of stricture, not only at the point of stricture, but also at other points in the canal. In the latter case the obstruction is due to spasmodic stricture, and it appears from many of the author's observations that, when a local irritation from any cause exists in this canal or in the pharynx, spasmodic contraction, not only at the seat of the irritation, but also at some other point, is very commonly met with. Experience and consideration of the treatment of cases of cicatricial stricture of the œsophagus have suggested four points as worthy of attention. The administration of an anæsthetic does not prevent spasmodic contraction when any irritation, such as the passage of a bougie, is applied, and, therefore, except as a means of preventing suffering and securing quiet, the author does not consider the anæsthetic as of any special value. The bulbous-pointed bougie on a flexible handle has been found the

most useful. The author has the ivory points varying in size from that of a number eight urethral bougie to that of a full-sized œsophageal instrument. In cases in which the obstruction is located in the cervical portion of the canal the author strongly advocates the performance of œsophagotomy immediately below the stricture, or the external division of the stricture, in preference to gastrotomy. In cases of cicatricial stricture gastrotomy shows more favorable results than in cancerous disease, but it should be practiced as soon as a careful trial of other methods has proved it likely to become necessary. The author is a strong advocate of the operation of œsophagotomy in both simple and cancerous strictures. One objection only is to be urged against it—the possibility, especially in cancer, of there being a second obstruction lower down in the canal; but even with this possibility in mind the author still prefers to practice the operation, and subsequently, if necessary, resort to gastrotomy. In one of his cases such a course was found to be necessary. In removing coins, the author has twice had the misfortune to have the patient shut his jaws on the coin-catcher just as the coin was opposite to the larynx, and very nearly cause suffocation. He therefore strongly recommends the introduction of a suitable gag as a preliminary step to any operation of this kind.

91. Dr. Lane reports a case of *gastrectomy with preliminary ligation of the gastric and splenic arteries.* The gastric was easily tied, but the splenic gave more trouble from its deeper position and close connection with the pancreas, but the ligation was finally accomplished by lifting up the pancreas with a blunt hook. A section of the cardiac portion of the stomach, three inches long by one inch wide, was then removed without hæmorrhage and without the application of a single ligature. The patient survived the operation two days.

103. Mr. Gay sums up a long attempt at an explanation of *the causation of hæmorrhoids* in the following remarkable language, which, as a specimen of blind English, deserves a permanent place in the literature of rectal disease: "What, then, are the special circumstances which determine, and thus lead to, the several forms of dilatation by which they are so often beset? The pathological facts before us, without logically arranging them, render it, I think, obvious that it is due to forces which obstructively affect their currents, in opposition to those which propel them; and, tracing the process physically by the same light, it is clear that the first step is vascular, and lies in vein repletion—local hyperæmia—either from ordinary or extraordinary causes; while the second, in the absence of any proof to the contrary, is extra-vascular, and can only be supplied by agencies, physical or physiological, usually combined, that are capable of acting upon the vein coats so as to obstruct them. The first of these forces collect on the capillary or ventricular, while the second are supplied on the opposite or auricular side, the issue of the conflict being just at those points in the vessels where the resultant blood tension is in excess of their powers of resistance. The contour, size, etc., of the bulgings indicate the amount of force expended on their production, and show that it is much less than that concerned in the production of aneurismal swellings, while their situation and distribution, especially the tier-upon-tier arrangement, one of their most common and characteristic features, point clearly to forces that act immediately on the veins athwart the normal course of their streams, and in a manner so as to give them the circular or gyrating form they assume. It follows, then, that these forces are such as no other than those engaged in the act of rectal defecation can yield—viz., intestinal peristalsis with the aid of its coefficients in that function. But superadded to these physiological energies there are clear indications of coöperative, intermediate, and subordinate agency in the form of matter passing through the intestine rendered passively potential by quantity or solidity, and not unfrequently by an abnormal state of its mucous surface. Difficult rectal defecation, then, is the most constant if it be not exceptionally the cause of these hæmorrhoidal dilatations, and, among the several agencies engaged, intestinal peristalsis takes, perhaps, the largest direct share, in consequence of the peculiarities in its nerve endowments. Thus the distribution and relative excitability of the excito-motor as well as vascular filaments in the rectal textures are such that their functional activity becomes more intense as these are displayed in nearer proximity to the anal orifice. Hence it is that, in this situation, varices are found in greatest numerical abundance, and usually attain the largest size, while here also reflex action displays itself in greatest activity by the formation of those folds of mucous membrane which incumber the outlet, and which with pile and other appendages often become distressing from their tendency to protrusion, and the gradually lessening power of the sphincter to retain them." [From all of which we gather that the great cause of piles is straining at stool—intestinal peristalsis with the aid of its coefficients in that function, together with the coöperative, intermediate, and subordinate agency in the form of matter passing through the intestine rendered passively potential by quantity and solidity (hard fæces?). We have not, however, taken up this article with any idea of ridicule, but rather with a sincere desire to discover, by the aid of hard reading, if necessary, what the result of the author's study might be; and we find one or two points worthy of notice, though nothing particularly original. He finds that piles affect exclusively the two lower branches of the hæmorrhoidal veins, and are not met with in those of the superior hæmorrhoidal. That they are either limited in segments of the vein coats, forming out of them small bulgings or pouches of various shapes—fusiform, ampullary, or clubbed; or they extend throughout considerable and continuous portions of a vein, even entire branches. The first of these forms he distinguishes as varix, the second as varicosity; and, further, by their seats, respectively as anal and rectal. They begin by attenuation of the affected portion of the vein coats by stretching, and the forms they assume become in the end permanent through organic changes which their tissues undergo. In the first form—varix—the vein coats undergo further degeneration, and the little sac gives way, bursts, and becomes thrombosed, and in this way undergoes a kind of spontaneous cure; or it becomes perforated by a ragged or retiform ulcer, followed by hæmorrhage, which is usually checked by the formation of fibrinous clots within. These clots may liquefy or be washed away, and repeated acts of hæmorrhage occur, or the little sacs may become permanently obliterated by thrombosis, which often extends to their veins. This is the usual course of the rectal-pile swellings. Again, it is not shown that, as alleged by some writers, piles are due to constriction of the veins by the muscular coats of the bowel in their passage between its fibers. Whatever be the form of their dilatations, they usually occur, especially the varices, at a distance from the point where the affected vein passes through the muscular wall, and it is not often that the portion of the vein on their cardiac side shows any signs of having been constricted. Ample provision is indeed made in all cases, anatomically, for the safe conduct of all classes of vessels, especially veins, through contractile tissue. Indeed, these hæmorrhoidally-disposed veins uniformly run between the mucous and muscular coats of the bowel, within the region of the latter. Anal hæmorrhoids, however, are not exempt from a liability to be indirectly affected by the action of the external sphincter, since by its extreme contraction it can not fail to exercise severe collateral pressure on their efferent veins, and often fatally to strangulate their bulbs. The division that has long been clinically admitted, into external and internal piles, seems to have very little justification for practical purposes. The latter have often been spoken of as much more serious products than the former. Mr. Syme has described them as "being very vascular, generally of a very florid color, and uneven on the surface, like a strawberry," and as being a morbid growth of the skin or mucous membrane and subjacent tissue. They are generally supposed to be exceedingly vascular outgrowths of the mucous membrane. The author has not found any objective evidence in support of these views; but, on the other hand, believes them to be vascular tumors, situated, like varices, in the course of the veins, and constituting a kind of erectile tissue. Excluding these, which seem to follow, in point of development, much the same laws as their varicial allies, which are usually met with within the rectum, there is no ground for this alleged practical distinction. They agree in all important points. The author remarks that, in these cases as well as in others in which he has stripped off the mucous membrane, he has not been able to find in any instance any evidence of blood extravasation, although no reasonable doubt could be entertained that the pile had bled during life. It follows that the process of perforation must, in its final stage, be rapid, and probably completed by the formation of superficial gangrenous eschars, which on separation gave rise to profuse hæmorrhage, such as that which sometimes suddenly overtakes hæmorrhoidal persons.]

105, 106. As showing the point to which the operation of *extirpation of cancer of the rectum* has reached, we transcribe the following case by Professor König, of Göttingen. The patient was a woman, aged seventy years, and the symptoms dated back about a year. The cancer began at about twelve centimetres from the anus, had the appearance of a narrow ring, and, though the index finger could be passed through it, healthy bowel could nowhere be reached. When the finger was hooked into the hard ring it was found to be quite freely movable. On the posterior vaginal wall was an isolated nodule, of the size of a nut. By examination through the abdominal wall, masses of fæces could be felt, but nothing further could be learned concerning the cancer. The woman was still in tolerable condition, and, as it was impossible to keep the bowels open, nothing remained but operation. Without concealing from himself that extirpation of the disease would probably be more difficult and dangerous in a patient of this age than the formation of an artificial anus, he determined upon the former operation. A posterior median incision was made, and through this the coccyx was exsected. By a circular incision the diseased upper part of the bowel was divided from the healthy lower portion, and separated partly with the finger and partly with Cooper's scissors. At first the separation was easy, especially at the back part, where the bowel was moderately sound, but further up not only was the whole bowel diseased, but also the connective tissue in front of the sacrum, and firmly adherent to the surface of the bone. Between the vagina and rectum the separation was easier, being facilitated by the existence of an old vaginal prolapse. On this account, also, when the diseased mass was completely separated at this part for a breadth of about six centimetres, the peritonæum appeared as a bluish, transparent sac. Another effort was made to separate the growth from its attachments posteriorly with the finger and long scissors, but it was found impossible, the whole hollow of the sacrum being filled with it, and even the tissue on its posterior surface involved. There remained now the choice between two courses—to open the front wall of the abdomen and dissect out the growth from above downward, or to open the peritoneal pouch in the vagina and make the attempt to complete the extirpation in this way. The latter was chosen as the simplest and likely to be the less harmful. The sac of peritonæum was therefore opened sufficiently to allow the hand to enter the abdomen. A strong double ligature was then passed around the bowel above the disease, and the cancerous mass was cut off between the two ligatures to prevent the escape of fæces into the peritoneal cavity. The whole mass was then cut out from the hollow of the sacrum. A few glands were removed from the circumrectal connective tissue, the hard mass was also detached from the vaginal wall, and the peritoneal wound was closed with catgut sutures. The upper end of the bowel was drawn down to the lower, a drainage tube was inserted, the wound in the peritonæum was made to approximate the external incision, and the parts were closed and dressed antiseptically. Before the operation the bowels had been freely emptied by injections through a long tube, but on the days immediately succeeding the operation more fæces were passed, and the dressings had to be changed. An abscess soon formed from the escape of fæces, and the posterior median incision was again opened to permit the escape of matter. The abscess increased in size and involved the gluteal tissues, and death followed on the seventeenth day. On autopsy there was no trace of peritonitis. The author goes on to say that with this surprisingly good result before him he can not but recommend the present combined intra- and extra-peritoneal operation above all others, but that the future must show in what cases this or any other operation is practicable. ═══ This is the first time, we believe, in the history of American surgery, that an attempt has been made to remove so much of the contents of the pelvis in a living subject through an incision in the perinæum. The peritonæum was opened, and the prostate gland cut out, but still the cancerous growth was not all removed. Result, death in forty-eight hours. [The only principle on which such an operation for cancerous disease of the pelvis can be considered justifiable is that similar operations have been attempted before in Germany and have succeeded. That this fact does in reality justify further attempts in the same direction, we do not believe. The rule with regard to extirpation of the rectum has again and again been distinctly enunciated. It is that when the cancerous disease is limited in extent and can be removed entire the operation may be tried with a fair prospect of recovery or temporary relief. The result of Dr. Briddon's experiment does not tend to weaken that rule; nor should such a case as this be allowed in any way to prejudice the profession against the operation in cases that are suitable. For the operation itself is a good one, and constitutes, perhaps, the greatest advance in the century in the surgery of the rectum, but, like many another good thing, it may be carried to excess, and this, we can not help believing, is the excess.]

QUARTERLY REPORT ON DERMATOLOGY.*

No. VII.

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6. Unna.—Ueber die kreisfleckige Exfoliation der Zunge und Hohlhand. [Aerztl. Verein zu Hamburg.] "Dtsch. med. Woch.," Aug. 20, 1881.
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9. Bulkley, L. D.—On the use of mineral waters in the treatment of eczema. "Arch. of Dermat.," July, 1881.
10. Soarenzio, A.—Prurito e prurigine. "Giorn. Ital. delle Mal. Ven. e della Pelle," Aug., 1881.
11. Roth, T.—Ueber Prurigo senilis. "Memorabil.," xxvi, 5, 1881.
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* I am indebted to Dr. George T. Jackson for assistance in preparing this report. —G. H. F.

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20. Barthélemy.—Sur un cas de sycosis non-parasitaire généralisé ou de folliculites agminées remarquablement nombreuses. "Ann. de Dermat. et de Syphil.," July, 1881.
21. Barthélemy.—Des verrues séborrhéiques ou verrues plates de la vieillesse. *Ibid.*
22. Giovannini, S.—Caso di acne ipertrofico ulcerato. "Giorn. Ital. delle Mal. Ven. e della Pelle," Aug., 1881.
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28. Araujo, S.—Ainda o tractamento da elephancia pela electricidade. "União Med.," Jan., Feb., 1881.
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31. Frazer, W.—On the use of iodoform in the treatment of diseases of the skin, and of croton-oil for porrigo decalvans. *Ibid.*, July 16, 1881.
32. Schilling, P.—Azione della pasta canforata del Beau in alcune dermatosi, e nelle piaghe atoniche. "Giorn. Ital. delle Mal. Ven. e della Pelle," Aug., 1881.
33. Pellizzari, C.—A study upon certain eruptions of the skin produced by the pathogenic action of iodide of potassium. "Arch. of Dermat.," July, 1881.
34. Prentiss, D. W.—Remarkable change of color of the hair from light blonde to nearly jet-black in a patient while under treatment by pilocarpine, etc. "Phila. Med. Times," July 2, 1881.
35. Reissner.—Ueber eine einfache Methode zur Aufbewahrung thierischen Impfstoffs, als Grundlage einer allgemeinen Einführung der animalen Impfung. "Dtsch. med. Woch," July 23, 1881.

7. Dr. Güntz advocates the use of the *soot from burnt pine in the treatment of eczema.* He claims for it that it is entirely painless; is applicable to all forms of the disease; causes no irritation either in the eye or in the ear; is not poisonous, so that it can be applied to the breasts of a nursing woman; and that its curative powers are surprising. He mixes the soot with pig's lard, and applies it every morning and evening for six days, then rubs it gently off, and repeats the operation till all is healed. He has had good results from this treatment in impetigo, prurigo, lichen, erythema papulatum, etc.

8. Dr. Bulkley, in writing of *the dietetic and hygienic treatment of eczema*, says that, in his experience, eczematous patients more often eat too much food than too little, this overfeeding being often the cause of the indigestion of eczematous infants. Mothers of such infants should not drink any ale, beer, porter, etc., but substitute for them milk, oatmeal, or thin gruel, and should wean them if they have been nursing them abnormally long. He believes that fat is an important item in the dietary of eczematous patients, but not cooked fat, as in fries, etc.; that the amount of meat should be reduced, and sometimes entirely cut off, fish being substituted; that coarse flour should be used for bread, and the bread should be twenty-four hours old before being eaten. Fermented liquors are to be avoided; soups are sometimes harmful; sweet potatoes, cabbage, bananas, and some apples, probably, have a harmful influence. Oatmeal is good, so, also, are well-cooked meats.

11. Dr. Roth recommends the use of

carbolic acid for prurigo senilis, given internally in pill form. He administers it in doses of one fifteenth of a grain four times a day, and reports five cases of cure.

26. From Dr. A. Neisser's contributions to *the etiology of leprosy* we learn that he holds the following theory, viz.: Leprosy is a true bacteria disease, produced through the agency of a specific form of bacteria (*Bacillen*), which enter the organism either as such, or more likely as spores which require a certain period of incubation, during which time they are stored up, probably in the lymphatic glands, this period of incubation being apparently shorter in the tropical than in the temperate zones. From these deposits the body is invaded, this being manifested chiefly in the skin, in the peripheral nerves, and to a less degree in the testicles, spleen, cornea, cartilages, and liver. By the presence of the bacteria, inflammation is set up, with consequent infiltration of the tissues with lymph cells, which change into lepra cells and form the leprous tubercles. The author believes leprosy to be infectious and contagious through its specific products, viz.: tubercles, the fluids of the tissues, and pus with bacteria.

30. Mr. Cottle says that *gynocardic acid*, the active principle of chaulmoogra oil, produces less disturbance of the stomach than the oil, and can be readily administered in pill form. Both oil and acid are useful in rheumatism, gout, and some late forms of syphilis. He has used both with benefit in leprosy, psoriasis, lichen planus, lichen scrofulosorum, lupus, and eczema, they being employed both internally and in the form of ointments. In eczema of the hands and face, both acute and chronic, he believes gynocardic acid, fifteen to twenty-five grains to the ounce of vaseline, to be almost a specific, the ointment being applied four or five times a day, or kept constantly applied by means of a mask or gloves. Internally we may begin with four minims of the oil, or half a grain of the acid, after eating, twice or thrice daily, and increase the dose gradually to half a drachm or a drachm of the oil, or from one to three grains of the acid. The acid is best given in pill form with extract of gentian or conserve of roses.

31. Mr. Frazer recommends the use of *iodoform in skin diseases*, an ointment of ten to sixty grains to the ounce of lard or vaseline being a most useful remedy in local eczematous eruptions occurring in strumous children and young people, and in impetigo. He has also used it with success in a case of trichophytosis capitis for which croton-oil had been used with disastrous effect.

33. Dr. Pellizzari thus concludes his study upon certain *eruptions produced by the action of iodide of potassium*. It seems rational to suppose that iodide of potassium may act pathologically in two ways when once carried into the blood: First, simply by its presence, giving rise to the general phenomena which show themselves according to the individual's susceptibility (idiosyncrasy), such as the excitement of the blood, erythema, activity of the mucous membranes, acceleration of the pulse, intellectual disturbances, intoxication, and irritation of the glands of the skin. Secondly, by a modified action of the blood crasis, when, for different reasons, instead of the eliminating process going on with activity, it ceases, and the drug is perhaps decomposed in the blood, and then attacks the corpuscular elements, and may produce atrophy of certain organs, loss of flesh, cutaneous hæmorrhages, or mucous discharges. Upon an alteration of the blood mass may easily follow the lesions of terminal vessels, giving rise to certain varieties of eruptions, which from their form, size, and seat, can not have a relation to those produced by a mechanical irritation of the glands of the skin.

34. Dr. Prentiss reports a case of *change of color of the hair from taking pilocarpine*. He gave the drug to a patient suffering from uræmia on December 16, 1880, and twelve days later he noticed that her hair, previously of a light blonde with a yellow tinge, began to change, and rapidly underwent an alteration in color until, in May, 1881, it had become almost of a pure black. At the same time her eyes changed from a light to a dark blue. The patient's age was twenty-five.

QUARTERLY REPORT ON ORTHOPÆDIC SURGERY.

No. VI.

By CHARLES T. POORE, M. D.,
SURGEON TO ST. MARY'S FREE HOSPITAL FOR CHILDREN.

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14. Jones, H. M.—Surgical cases. Morbus coxarius. "Lancet," July 2, 1881.
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41. Bradford, E. H.—Resection of the tarsus for club-foot. "Boston Med. and Surg. Jour.," Sept. 15, 1881.
42. Norton, A. T.—A new and reliable operation for the cure of web-fingers, etc. [Brit. Med. Assoc.] "Brit. Med. Jour.," Sept. 3, 1881.

3. Mr. Wright contributes the following cases of *acute suppurative arthritis in infants* during the first year of life, and remarks that the disease is acute in its onset, generally affects but one joint at first, and produces great depression of the child's powers; that it is exceedingly destructive, not only to the joint, but to the ends of the bones forming the articulation, in which, indeed, the lesion originates. ═══ Case I.—When the child was fourteen days old a swelling was noticed in the calf of the left leg; this disappeared, and the child was then said to have had an attack of erysipelas of the thigh and groin, and the inflammation seemed to focus itself in the left knee, below which an opening formed, from which a discharge escaped up to date of observation. The child was very ill, with a temperature of 103° F. Through the sinus soft carious bony detritus was felt and gouged away from the upper part of the bone (tibia). There was pus in the knee joint. The joint was then freely incised on each side, and a drainage tube was passed through it. During the first twenty-four hours the child had carboluria, and died on the thirteenth day. The joint was completely disorganized. ═══ Case II.—Child aged thirteen months. Two months before observation it had measles, followed by temporary albuminuria. One month later pain and swelling appeared, extending from hip to knee. Two weeks later the child was feverish, with vomiting, and much pain in the knee. There was no history of an injury. The family history was good. There was found great swelling around the right hip, reaching up to the buttock, into the groin, and over the lower part of the abdomen, where fluctuation was marked. The abscess was opened antiseptically. The head of the femur was found exposed and rough, and the joint entirely disorganized; the wound was washed with a one-to-forty solution of carbolic acid. The same night the child was collapsed and carboluria appeared. Ten days later the upper end of the femur was removed, and a small, rough, carious button of bone, covered with granulations, was found to be the only representative of the head and neck of the femur. The child recovered and had considerable power over the limb. The limb was half an inch shorter than the sound one. ═══ Case III.—Child aged nineteen days; was said to have been healthy at birth; no syphilitic history. A day or two before observation the child was apparently in pain, and the day previous a swelling was noticed around the right shoulder. This abscess was opened antiseptically and the cavity was explored, but no communication with the joint could be made out. Afterward a swelling appeared in the parotid, and suppuration occurred; then an abscess appeared over the lower part of the sacrum, and another about the left hip joint. The joint was opened, and the upper end of the femur was removed. No trace of the head of the bone was left. This child also suffered from carboluria. She died two days after the operation. On post-mortem examination the shoulder joint was found to be completely disorganized, and no trace of the head or neck of the humerus could be found. The lower sacral joints were diseased. There were pyæmic abscesses in different portions of the body. ═══ This disease has been described by Mr. Holmes, and Mr. Thomas Smith has given a very complete account of it in a paper in "St. Bartholomew's Hospital Reports" for 1874. A noteworthy point in these cases is the great extent of the primary inflammation, which seems to attack a large area of the limb before it concentrates itself upon the particular joint. Of the twenty-one patients whose cases are reported by Mr. Smith thirteen died, and in none was any operation performed, except opening the abscess. Mr. Baker reported some cases of this disease in "St. Bartholomew's Hospital Reports" for 1880. [The presence of carboluria in the three cases is worthy of note.]

4. In a discussion on *the early recognition and treatment of spinal caries*, at the recent meeting of the British Medical Association, it was noted that the analogy between this affection and early knee-joint disease was very close. In making a diagnosis of disease of the spine before deformity appeared, the necessity of carefully watching all the movements of the patient was pointed out; a careful inquiry should be made into his habits, to learn if there was any change therein; heed must be given to little matters, which were full of indications and suggestion. Mr. Owen advocated absolute rest on the back on a firm, flat mattress. If the case required any length of treatment, he advocated a Sayre's jacket. ═══ Mr. Smith considered that Sayre's jacket retarded the growth of the thorax.

7. The following cases are of *caries of the spinal column without suppuration presenting externally*, and occurring in patients over fifty years of age. Case I.—Patient a man aged sixty-nine. After exposure to cold and wet he felt pains across the lower part of the back. A month later the inferior extremities became weak, and dragged slightly. Sensation was impaired; numbness, first noticed in the toes, crept up both limbs. He had starting of the limbs at night, straining in micturition, and afterward constipation. On examination, motor power and sensation of the lower limbs were very limited, reflex action being increased. Shortly after he had retention of urine, three months before death, and one year after the first symptoms there appeared a prominence of one of the lower dorsal spines. There was a sensation of constriction around the abdomen. Fifteen months after the initial symptoms he died from exhaustion. On post-mortem two abscesses were found, one on either side of the spinal column and communicating with each other, containing pus mixed with bone fragments; the cartilage between the tenth and eleventh dorsal vertebræ had disappeared; the tenth vertebra was eaten away in its lower surface. Above the point of disease the membranes and cord were normal; below, the dura mater was thickened and adherent to the spinal canal by means of an inspissated layer of pus, mixed with bone spiculæ; the cord was slightly softened. The lungs showed evidence of old trouble. ═══ Case II.—A man aged fifty-five. Four years previous to admission into hospital, patient fell from a considerable height on his back; for the last two years he had experienced weakness and pain in the lumbar region. The last dorsal spinous process was slightly prominent. At times he had intractable pain in the area supplied by the lateral branch of the last dorsal nerve. No paralysis. Patient died suddenly of pneumonia. Post-mortem.—There were caseous nodules in the apices of both lungs. The disc between the last dorsal and first lumbar vertebræ had disappeared; the dura mater opposite this point was thickened and incrusted with a layer of thick pus. Cord normal. Pus had burrowed along each side of the spine in the psoæ muscles. The twelfth dorsal and first lumbar vertebræ were carious. ═══ Case III.—A man aged

sixty-seven was admitted into hospital with caries of the right tibia of ten years' duration. While under observation he lost flesh, and complained of pain across the lower part of the lumbar spine. He died suddenly in convulsions. Post-mortem.—Hæmorrhages were found at the base of the brain. Miliary tubercles in both lungs. Superficial caries of the fourth and fifth lumbar vertebræ. Abscess in both psoæ muscles. ═══ Case IV.—A woman aged sixty-eight was admitted into hospital with symptoms of gastro-hepatic derangement. Had neuralgic pains in the upper part of the abdomen on the right side. Two days later there was pain on pressure over the lower dorsal vertebræ, followed by some loss of motor power in the lower limbs, attended with cramps. Subsequently there was total motor paralysis of the inferior extremities with abolition of sensation, the sole-reflex being subnormal. Incontinence of urine. Death from œdema of the lungs. Post-mortem.—The body of the seventh dorsal vertebra had almost entirely disappeared, the intervertebral disc not being affected. There was an abscess in front of the diseased bone, containing fragments of bone. The dura mater was adherent to the body of the seventh dorsal vertebra and much thickened. The cord at this point was softened and lessened in bulk. Lungs emphysematous. A daughter of the patient had died of hip-joint disease, and a son of hæmoptysis.

14. Mr. Jones reports four cases of *excision of the hip joint.* Two patients died from amyloid degeneration; one entirely recovered with but a slight limp, and in one the wound had not closed, and looked unhealthy, although the operation was performed more than two years and a half before. In regard to the management of hip-joint disease, the author advocates the use of a long splint, either Sayre's, Bryant's, or Thomas's. In case of abscess he has seen good results follow aspiration, both outside and inside the capsule.

18. M. Brachet reports the following case of *hysterical hip-joint disease cured with the magnet:* A girl eighteen years of age, of nervous temperament, and with a tendency to chlorosis, was seen, in 1879, complaining of pain in the right ovarian region; even the pressure of her clothes caused great suffering. The daily application of a magnet during half an hour removed the pain after fifteen *séances.* Six months later she developed what was looked upon as a coxalgia. She was treated by rest for six months. At the end of this time there was anæmia, with loss of flesh. Exaggerated nervous sensibility, irritability, despondency, sleeplessness, and distaste for food. There was continuous violent pain about the right hip joint, aggravated by any attempt to walk, increasing toward evening, but diminishing a little in the morning. There was hyperæsthesia of the thigh, greater when touched suddenly and over a small surface, less when pressed upon firmly and with the whole hand. There was slight pain at the inner aspect of the knee on the same side in the course of the obturator nerve; there was also hyperæsthesia along the spinal column and in the left intercostal region. All of these symptoms were exaggerated during a menstrual period, which was always very painful, with an abundant flow. There was no change in the color of the skin in the painful region; no difference of temperature between the two hips. The thigh was flexed and abducted on the pelvis, without any crepitation on motion. There was no evening elevation of temperature. Considering the ovarian pain from which the patient suffered in 1879, the absence of any hereditary or traumatic influence, the remissions of the pain, the slight pain caused by pressure on the trochanter major, the acute pain caused by simple pressure on the skin, the absence of pain under Poupart's ligament, the absence of any articular or circumarticular swelling, a diagnosis of hysteria was made, and the application of a magnet was determined upon. After the first two nights passed under the influence of a magnet placed five centimetres from the painful hip, sleep returned, and the character of the pain completely changed. The application was continued every evening. The pain diminished little by little (not suddenly, as we often see in hysterical coxalgia). After two months of this treatment the patient could run, jump, and dance without the least pain. M. Brachet does not think that the mental impression was the cause of the cure. The relief was slow and progressive, and should be entirely attributed to the application.

25. The discussion on *genu valgum* was opened by Dr. Macewen, who stated that the deformity was most frequently, and principally, due to an internal curvature of the lower third of the femur, occurring in 120 out of 166 limbs. With this there was generally associated an increase in the length of the internal condyle, although this played a secondary part in the formation of the deformity. The tibia was affected in about one third of the cases. In the first four or five years of life genu valgum ought to be treated medically, by hygiene and attention to the limbs; but hard and fast lines could not be drawn. He would not operate during the stage of *ramollissement.* ═══ Mr. Brodhurst regarded this deformity as a constitutional rather than as a local defect, accompanied for the most part by a relaxation of the ligamentous system in general, and preceded by flat-foot; and to this relaxation he attributed the deformity. He admitted an elongation of the internal condyle. He thought that the deformity could be removed by division of the biceps tendon and the use of splints. ═══ Dr. Little looked upon genu valgum as a change in the form and relations of the knee joint. Even a sound knee might be affected with this deformity through over-use. He considered that enlargement of the internal condyle and contracture of the biceps tendon were among the consequences, and not the causes. It might exist at birth, or originate, in fast-growing infants, from want of the mother's milk, independent of rachitis; from rachitis; from infantile paralysis; during the treatment of club-foot; during weakness subsequent to any debilitating disease. He thought that if the knee were maintained in a state of extension and adduction the deformity in young children could be removed. If force were necessary, osteotomy was the preferable form, especially Macewen's method. ═══ Mr. A. E. Baker agreed with Dr. Macewen and Dr. Little. He thought that, though many cases of genu valgum required no operation, osteotomy was sometimes desirable. Instrumental treatment might suffice for the stage of softening, but, when the bones had become hard, osteotomy was called for. ═══ Mr. Noble Smith thought that osteotomy had been carried too far. He had watched the progress of over one hundred cases of genu valgum treated by instruments, all of which had done well.

33. The author of this paper advocates *osteotomy for rachitic curves of the tibia and fibula*, putting the limb up in plaster of Paris and sending the patient home as soon as all effects of the anæsthetic have passed off. In four cases reported he does not seem to have had any mishap.

40. The good result obtained from an *excision of the whole tarsus* is illustrated in the following case: A girl with an indolent, semi-elastic swelling, involving the entire ankle joint, came under the author's care. The malleoli were sawn off, the os calcis was dissected out subperiosteally, and the remaining bones were removed with gouge, forceps, and knife. No tendons were cut. The wound entirely healed, and the patient now walks well. There appears to be a new osseous growth; the situation of the tarsus is occupied by a solid mass. She has complete control over the toes, and a fair movement exists in the present ankle joint.

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Miscellany.

ITEMS.

Alumni Association of the Albany Medical College.—At a meeting of the executive committee of the Alumni, held June 16, 1881, the President, Dr. A. VanDerveer, offered an annual prize of $100, to be called "A Surgical Prize," and announced as the subject for this year *Colles's Fracture, its Pathology and Treatment;* the essay to be accompanied with a pathological specimen illustrating the fracture, with or without dislocation of the ulna, or a careful dis section of the hand, wrist, or forearm. Subsequently, he reported that the heirs of the late Professor Alden March desired to give the sum of $100 as an annual "March Memorial Prize"; the essay for the coming year to be on the *Pathology and Treatment of Morbus Coxarius.* Mr. McClure, a governor of the Albany Hospital, will also give the sum of $100 annually as an "Armsby Memorial Prize"; the essay to be on some anatomical subject. That for the coming year will consist of a minute description of the *Genito-urinary Organs of the Male*, together with a carefully-dissected specimen of the same. The heirs of the late Professor James MacNaughton offer the sum of $100 as a "MacNaughton Memorial Prize"; the subject of the essay for the current year to be *Antisepsis in the Treatment of Diseases.* Mr. Joseph Russell, a trustee of the college, offers for this year a second surgical prize of $50 for the second best essay on *Colles's Fracture.* Essays and specimens, designated by a motto and accompanied by a sealed envelope inclosed with the same motto, and containing the name and address of the author, must be sent to the Secretary, Dr. W. G. Tucker, by the 14th of February, 1882. The committee to examine the essays for this year will consist of Drs. A. VanDerveer, J. S. Mosher, and Lorenzo Hale, and they reserve the right to reject any or all the essays if not deemed worthy. All specimens are to be deposited in the new museum of the college, properly labeled.

THE "OHIO MEDICAL JOURNAL."—This is the journal of the Ohio State Medical Society, and takes the place of the usual volume of "Transactions." The editor is the Secretary of the Society, Dr. J. F. Baldwin, of Columbus, who is assisted by four associate editors: Dr. J. H. Lowman, of Cleveland; Dr. T. C. Minor, of Cincinnati; Dr. G. A. Collamore, of Toledo, and Dr. W. J. Conklin, of Dayton. Dr. Baldwin was formerly the editor of the "Ohio Medical Recorder," which he succeeded in carrying to a high degree of prosperity, and which is now merged into the new enterprise, while the associate editors are said to have had more or less experience in journalistic work. The early numbers of the new journal make a creditable appearance.

THE "ATLANTA MEDICAL REGISTER."—This is the new name of the "Atlanta Medical and Surgical Journal." The publisher gives a list of eminent physicians from whom he has been led to expect contributions during the coming year.

ARMY INTELLIGENCE.—*Official List of Changes of Stations and Duties of Officers of the Medical Department, United States Army, from September 14, 1881, to October 13, 1881.*—MURRAY, Robert, Colonel and Surgeon, Medical Director Military Division of the Missouri. Granted leave of absence for two months. S. O. 100, Military Division of the Missouri, October 5, 1881. ═══ ALEXANDER, R. H., Major and Surgeon. Relieved from duty in Department of the East, to take effect October 1, 1881, and granted leave of absence for three months, with permission to apply for one month's extension, at expiration thereof to report by letter to the Surgeon-General. S. O. 215, A. G. O., September 19, 1881. ═══ BYRNE, C. C., Major and Surgeon. To proceed from Wilcox to Camp Thomas, Arizona Territory, and report to the commanding officer for duty in the field. F. O. No. 4, Department of Arizona, September 9, 1881. ═══ WOODHULL, A. A., Major and Surgeon. Granted leave of absence for four months. S. O. 227, A. G. O., October 7, 1881. ═══ HUNTINGTON, D. L., Major and Surgeon. Relieved from duty as attending surgeon at the Soldiers' Home, District of Columbia, and to report in person to the Surgeon-General for duty as curator of the Army Medical Museum and to take charge of the division of surgical records of the Surgeon General's Office. S. O. 217, A. G. O., September 24, 1881. ═══ BROWN, Harvey E., Major and Surgeon. Granted leave of absence for four months. S. O. 220, A. G. O., September 29, 1881. ═══ CLEARY, P. J. A., Captain and Assistant Surgeon. Granted leave of absence for six months on surgeon's certificate of disability, with permission to apply for six months' extension, if necessary. S. O. 224, A. G. O., October 4, 1881. ═══ KOERPER, E. A., Captain and Assistant Surgeon. Assigned to duty at Plattsburgh Barracks, New York, as post surgeon. S. O. 180, Department of the East, October 7, 1881. ═══ KING, W. H., Captain and Assistant Surgeon. To proceed without delay to Fort Trumbull, Connecticut, and report to the commanding officer for temporary duty. S. O. 176, Department of the East, October 3, 1881.

——— Ewen, Clarence, Captain and Assistant Surgeon. Granted leave of absence for one year on surgeon's certificate of disability, with permission to go beyond sea. S. O. 220, C. S., A. G. O. ——— Dewitt, C., Captain and Assistant Surgeon. Now on leave of absence, to report in person to the governor of the Soldiers' Home, District of Columbia, for duty as attending surgeon at the Home. S. O. 217, C. S., A. G. O. ——— O'Reilly, R. M., Captain and Assistant Surgeon. Granted leave of absence for six months from December 1, 1881, on surgeon's certificate of disability. S. O. 225, A. G. O., October 5, 1881. ——— Heizmann, Charles, Captain and Assistant Surgeon. Relieved from duty at Fort Townsend, Washington Territory, and assigned to duty at Vancouver Barracks, Washington Territory, as post medical officer, relieving Assistant Surgeon Dickson. S. O. 135, Department of the Columbia, September 9, 1881. ——— Hall, John D., Captain and Assistant Surgeon. The leave of absence granted him in S. O. 141, August 4, 1881, Department of Dakota, is extended three months. S. O. 220, C. S., A. G. O. ——— Harvey, P. F., Captain and Assistant Surgeon. Granted leave of absence for twenty-five days, to take effect on adjournment of the G. C. M., of which he is a member. S. O. 182, Department of Dakota, October 5, 1881. ——— Cowdrey, S. G., Captain and Assistant Surgeon. Granted leave of absence for four months. S. O. 228, A. G. O., October 8, 1881. ——— Adair, George W., Captain and Assistant Surgeon. Upon relinquishing unexpired portion of his present leave of absence, relieved from duty in Department of the East and assigned to duty in Department of Dakota. S. O. 230, A. G. O., October 11, 1881. ——— Maus, L. M., Captain and Assistant Surgeon. Granted leave of absence for four months. S. O. 222, C. S., A. G. O. ——— Reed, W., Captain and Assistant Surgeon. Assigned to duty with Light Battery A, Second Artillery, ordered to leave Washington Barracks, District of Columbia, on September 20, and march to Yorktown, Virginia. S. O. 165, Department of the East, September 16, 1881. ——— Cunningham, T. A., Captain and Assistant Surgeon. Granted leave of absence for one month on surgeon's certificate of disability. S. O. 102, Department of the South, September 17, 1881. ——— Burton, H. G., Captain and Assistant Surgeon. To accompany Light Battery C., Third Artillery, as medical officer, on its march from Fort Hamilton, New York, to Yorktown, Virginia, *via* Trenton, New Jersey; Philadelphia and Columbia, Pennsylvania; Baltimore, Maryland; and Washington, District of Columbia, and remain with it until further order. S. O. 163, Department of the East, September 14, 1881. ——— Appel, D. M., Captain and Assistant Surgeon. Relieved from duty at Fort Supply, Indian Territory, and assigned to duty at Fort Elliott, Texas. S. O. 201, Department of the Missouri, October 4, 1881. ——— Robinson, S. Q., First Lieutenant and Assistant Surgeon. Granted leave of absence for four months. S. O. 228, C. S., A. G. O. ——— Gray, William W., First Lieutenant and Assistant Surgeon. Relieved from duty at Fort Canby, Washington Territory, and assigned to duty at Fort Townsend, Washington Territory. S. O. 135, C. S., Department of the Columbia. ——— Strong, N., First Lieutenant and Assistant Surgeon. When relieved by Assistant Surgeon Shannon from duty at Fort Thornburgh, Utah Territory, assigned to temporary duty with troops repairing road between Park City and Fort Thornburgh, Utah Territory. S. O. 102, Department of the Platte, October 4, 1881. ——— Taylor, A. W., First Lieutenant and Assistant Surgeon. Assigned to duty as medical officer with escort conducting Little Chief and his band to Department of Dakota, and on return to report to the Medical Director at Department Headquarters. S. O. 188, Department of the Missouri, September 16, 1881.

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ACCIDENTAL ANTE-PARTUM HÆMORRHAGE.

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Hæmorrhage, as it may and often does occur in connection with pregnancy, parturition, or the lying-in state, requires, for appropriate and successful treatment, a thorough comprehension of natural resources. To set in motion and carefully guard and direct natural powers is often of more benefit than hastily to resort to the use of many of the much-vaunted medicaments which, in themselves, often fail, while at the same time they divert the mind of the practitioner from the primary object of his treatment, which is to rally and aid the forces which naturally belong to the parturient woman.

Accidental hæmorrhage is an escape of blood from the utero-placental circulation, caused by a separation of a normally-situated placenta from its attachment. To characterize this form of hæmorrhage as distinctively accidental is unwarrantable and arbitrary, yet the designation is accepted by most writers, and, used as we have stated in the definition, and for that reason—and that only—serves to convey an idea of the condition and to distinguish it from the other variety of ante-partum hæmorrhage, which is termed unavoidable. "Why," says Barnes, "should a hæmorrhage arising from spontaneous detachment of placenta, brought about by disease or emotion, of which we often know nothing—that is, nothing more than we know of the existence of placenta prævia—until its consequence, hæmorrhage, has broken out, be specially characterized as 'accidental?'"

Varieties of this form of hæmorrhage exist, differing in gravity and in the group of symptoms. When blood is effused in any considerable amount between the uterus and placenta, if the loss continues, the blood may escape from the os uteri into the vagina, after having dissected its way between uterus and membranes, and the fact of the hæmorrhage be then apparent. On the other hand, we may have the variety known as concealed internal hæmorrhage, in which there is no appearance of blood externally. In such cases, if hæmorrhage continues, and a large amount of blood accumulates within the uterus, grave symptoms may supervene. Cases of the latter class are always very serious, not only because of the dangerous and even fatal symptoms, but also because nothing short of the closest scrutiny, oftentimes, will develop the precise nature of the case and the cause of the symptoms. The term accidental hæmorrhage is somewhat arbitrarily restricted to loss of blood, such as described, occurring during the last three months of pregnancy, though the first variety does not differ essentially in nature from the hæmorrhage of abortion. Whatever difference exists depends upon the differing relation, especially with reference to circulatory connection, which the contents of the uterus bear to the organ itself in different periods of pregnancy.

The second variety could not readily take place in the early months of pregnancy, owing to the small size of the uterus and the incomplete development of its structure.

The exciting causes of this condition (Barnes) are: *a*, contractions of the uterus, which disturb and break the relations of surface between uterus and placenta; *b*, undue, especially sudden, determination of blood to the uterus and placenta; *c*, external violence. Careful study shows also a predisposition toward the occurrence of this variety of hæmorrhage in those of weak constitution. It is a well established fact that the condition of pregnancy brings about a deteriorated state of blood, with increase of fibrine and fats. The greater extent to which the blood is thus changed, especially if the woman is naturally anæmic or of feeble constitution, the greater will be the tendency to accidental hæmorrhage. Women who have borne many children, those advanced in life, and such as from poverty or other reason are poorly nourished are chiefly predisposed to it.

Returning to the exciting causes, it must be borne in mind that during pregnancy there are normally rhythmical contractions of the uterus of painless character, and that near the end of pregnancy, owing to the more complete development of the muscular fibers, these contractions, if excessive, may endanger the integrity of the utero-placental circulation, and if slight laceration occur, and a small clot form, we have then a further cause for uterine irritability. Active contractions of the uterus in pregnancy are usually spasmodic and irregular, a portion only of the uterus participating, and thus local congestions are favored, leading readily to hæmorrhage. A large or diseased placenta, when such contractions occur, would not perfectly follow the undulatory or peristaltic uterine action, and thus its separation would be increased. In diseased placentæ, the morbid condition often extends to the vessels and renders them weak and liable to rupture, while the feeble union of the placenta to the uterus allows of the detachment of the former, and makes room for the extravasation.

Emotion is well known as a cause for sudden uterine action, and may lead to hæmorrhage. External violence, such as blows or falls, may lead directly to detachment of the placenta, while, indirectly, such injuries, as well as lifting, straining, or vomiting, by producing uterine contraction, or local or general uterine congestion, may bring about the same result.

The symptoms of accidental hæmorrhage, when it is not of the concealed variety, allow of an easy diagnosis. Hæmorrhage and pain—the latter, however, varying greatly in degree—are the chief symptoms. When the extravasated blood has once found exit from the uterus through the os, it is not at all probable that any great accumulation will occur within the uterus. In such cases, therefore, the pain is apt to be local and of subacute character, and there will be no appreciable shock; yet it is not uncommon to have the uterus excited to action, and labor set in. It is of primary importance in these cases to determine that placenta prævia does not exist, and we can ascertain this by physical examination.

In concealed hæmorrhage the amount of blood extravasated may be very great. The situation of the placenta in this condition is likely to be in the upper half of the uterus, and the first extravasation most commonly occurs near the middle of the placenta. Hæmorrhage continuing, the effusion takes that direction in which there is least resistance. If it proceeds in any direction except downward toward the cervix, an enormous amount may be lost from the general circulation without any external loss. When the extravasation is confined by the adherent margin of the placenta, or by the membranes, distention and bulging of the uterus are produced, and even rupture.

An examination of the uterine contents expelled after the birth of the child reveals the placenta flattened or hollowed on its maternal surface, and a large amount of coagulated blood of varying color and consistence, some being partially decolorized and quite firm. The pain that occurs in these cases is wholly different from that of natural labor. It is cramp-like and constant, and conveys to the patient the idea of extreme tension. It is often of the most severe and agonizing character, and is chiefly confined to a circumscribed part of the abdomen. It is an early symptom, but soon there is associated with it the group of symptoms which indicate collapse.

The state of collapse arises in part from loss of blood and in part from shock to the nervous system. It is indicated by the feeble and quickened pulse, pallor and a pinched expression of countenance, coldness of the surface of the body, shallow respiration, restlessness, and retching.

It will be noted at the same time that labor pains are absent or feeble in character. Palpation, under the favoring circumstances of a thin and relaxed abdominal wall, will show in extreme cases distention and irregularity of uterine contour.

Opposite the situation of the extravasation an accessory tumor (Baudelocque) may be present, caused by a bulging of the uterine wall. Not infrequently a discharge of blood or of serous fluid will appear after these symptoms have persisted some time. Serous discharge from the vagina is not the escape of amniotic fluid, but is the watery element of the coagula, which by their compression is forced out.

The rupture of the membranes near the seat of the effusion, and the consequent appearance of blood in the liquor amnii, holds, as a symptom, the lowest rank in the order of frequency (Goodell), because, should the os uteri be closed, the membranes, however delicate, can not, other things being equal, rupture any sooner than the uterine walls, for the sum of resistance of the inclosed liquor amnii, being equally distributed, exactly counterbalances the sum of the pressure exerted by the effusion.

It is possible to have the appearance of blood externally in moderate amount, while at the same time a considerable extravasation has taken, and *is taking*, place within the uterus. The symptoms of this latter condition and those of true concealed hæmorrhage are the same, differing only in degree.

The diagnosis is extremely obscure and embarrassing, as we learn from the united testimony of all observers (Goodell). This should not be regarded as discouraging, but should lead to the closest scrutiny of a doubtful case, and the use of the greatest judgment.

At the onset of the symptoms the condition of intestinal colic would most resemble that of concealed hæmorrhage. A careful examination of the pregnant uterus, and the occurrence of the more severe symptoms, especially those of loss of blood, would be the means for determining between the two conditions.

We should remember, however, that severe gastro-intestinal disorder, with the accompanying retching, peristalsis, and straining, might be the exciting cause which would add the graver condition of concealed hæmorrhage. When the symptoms of collapse are present, the accident might be mistaken for rupture of the uterus. The history of the case would help us to a diagnosis, in that the former condition occurs prior to or early in labor, while the latter takes place at a later stage. Uterine rupture is attended by retrocession of the presenting part and diminution in the size of the uterus when the fœtus has wholly or in part escaped from that organ, and the membranes are relaxed or more commonly ruptured. Concealed hæmorrhage causes increased size of the uterus, and the membranes are usually entire.

The prognosis is grave. In 106 cases collected by one writer (Goodell), 54 mothers died, and of 107 children only 6 survived. An early and correct diagnosis in all cases would diminish this death rate somewhat.

The treatment demands the exercise of great judgment. We may wait in some cases to "see what Nature can effect, not what she can endure." In the variety of accidental hæmorrhage attended by the escape of blood from the os, without the occurrence of symptoms of shock, the labor is likely to set in spontaneously and the case terminate favorably—or the hæmorrhage may cease, and pregnancy continue to its natural termination. If in these cases we find the constitutional signs of hæmorrhage persisting, even in slight degree, close attention must be given with a view to assisting in delivery *before* alarming symptoms occur.

We must not forget that the safety of the child is endangered, not only in case of its premature expulsion, but also by loss of blood and injury to the utero-placental circulation. In the grave cases of accidental hæmorrhage there is no safety until after delivery, which is, therefore, urgently called for. It must be brought about speedily, while every measure is taken to diminish the hæmorrhage which will be continuing in greater or less degree. At the same time no means should be overlooked to rally the woman from the effects of shock and hæmorrhage. Dilatation of the os must be brought about, or aided, by artificial means.

In the grave cases of ante-partum hæmorrhage, alarming symptoms of loss of blood and shock being present, with no indication of labor, many writers advocate the immediate rupture of the membranes and evacuation of the liquor amnii. Inasmuch as I desire to consider critically this mode of treatment, I will quote from several authors regarding it.

Playfair says: "The first thing to be done, whether the hæmorrhage be apparent or concealed, is to rupture the membranes. If the loss of blood be slight, this may suffice to control it, and the case may then be left to Nature. A firm abdominal binder should, however, be applied to prevent any risk of blood collecting internally, as there is nothing to prevent its filling the uterine cavity after the membranes are ruptured." He then recommends ergot and uterine compression to promote contraction and the extraction of the child as soon as the condition of the os will admit of its passage. He adds: "If the os be not open enough, a Barnes's bag should be introduced, while firm pressure is kept up to prevent uterine accumulation."

Schröder says: "If labor has so little advanced that an immediate delivery appears inadvisable, ergot is to be given internally, and attempts are to be made by strong friction to make the uterus contract." "If that is of no avail, and the bleeding persists, and the patient is still collapsed, the membranes must be ruptured." He adds, also: "Of course, there is risk that the emptied uterus, if it remains flaccid, will only afford room for a large quantity of blood." "Since after the partial emptying of its contents it can easily be distended to its previous volume, great caution is required in the use of the tampon after the rupture of the membranes, lest an external hæmorrhage be converted into an internal one." "The redistention of the uterus must be prevented by friction of the fundus and by the internal use of ergot."

Leishman says, regarding accidental hæmorrhage: "In so far as treatment is concerned, the first step is undoubtedly to rupture the membranes so as to give egress to the liquor amnii." He then goes on, like the writers already mentioned, to point out the dangers from accumulation of blood in the partially emptied uterus. He thinks one advantage of this treatment is the compression of the placenta between the uterus and the child, whereby hæmorrhage would be checked. He admits, however, that version, which is often demanded in the subsequent treatment, must be rendered somewhat difficult after evacuation of the liquor amnii.

Barnes says: "The first thing to be done is to rupture the membranes." Other writers could be quoted to like purpose were it advisable to occupy time in so doing. The treatment by rupture of the membranes is based upon the belief that by this procedure the strain is taken off from the uterine fiber, and that uterine contraction will act as an hæmostatic.

I think the dogmatic manner in which advice has been given by the authorities quoted justifies me in dwelling upon this part of the subject, especially as I believe, first, that rupture of the membranes does not meet the indications—i. e., it does not in itself or in its results offer any reasonable probability of checking the hæmorrhage—and, secondly, that the method is highly dangerous from the increase of facilities for loss of blood, and because it adds to the difficulty and danger of the proper subsequent steps in treatment.

We may first consider whether rupture of the membranes does check hæmorrhage. It can not do so unless a decided decrease in uterine bulk can be secured and maintained thereby. There must, therefore, be a considerable number of cases in which, a small amount of liquor amnii being present and the reduction in size being very slight after its escape, no benefit can accrue. In cases which present an average amount of amniotic fluid, after its evacuation the uterus is decidedly, though not greatly, diminished in size. What is to show, however, that this decrease is sufficient to close the mouths of bleeding vessels? There is no practitioner who can not affirm that alarming hæmorrhage does often threaten after the birth of the child and before or after the complete separation of the placenta, when the uterus is *greatly contracted.* Even this degree in the reduction of bulk fails to close the uterine sinuses in the intervals of contraction.

All those writers who advise rupture of the membranes couple with this advice (as we have shown) the information that there is danger of continued hæmorrhage. One says, "Of course, there is risk," while all suggest methods by which they think a loss and a large accumulation of blood can be prevented after the escape of the amniotic fluid—these suggestions looking toward the maintenance of contraction. Let us regard for a moment the condition which calls for treatment. Accidental hæmorrhage has occurred, as is usually the case, prior to or during the occurrence of infrequent and slight early uterine contractions, when the os is slightly dilated or not at all. Superadded is the condition of collapse. If the liquor amnii is now permitted to escape, can any candid, practical obstetrician admit that there is any known way by which a momentary reduction of uterine bulk can be maintained for a period which will check an alarming hæmorrhage?

The uncertainties and tediousness of efforts at excitation of the uterus in cases of induction of labor afford a good illustration of the difficulties which would be encountered. Ergot is uncertain and almost valueless, for the stomach will either reject or fail to absorb it; or, if absorption does take place, or if the drug is given by the hypodermic method, its action is imperfect when there has been a great drain upon the vital powers.

The abdominal binder can not be applied in a way to crowd the resilient uterine tissue into contraction. Manual efforts can not be kept up with any precision or efficacy during a period necessary to check the hæmorrhage and keep it in control. Good uterine action can not be excited when the uterus is surprised into labor. Good labor pains will not occur when the patient is exsanguinated.

The suggestion of Leishman, to the effect that the placenta will be compressed between the uterus and the child after the escape of the liquor amnii, and hæmorrhage thus be checked, is, I think, fanciful; for no sufficient uterine action will take place to effect this. There are a great many chances also that the part of the child nearest the placenta would not be one which could make an even, perfect compression, if suitable uterine action did take place. I think it must be admitted that the method of treatment is wholly inadequate to the emergency in the vast majority of cases. This is not all that is to be said, however, for the method increases greatly the dangers of the already serious condition. If the uterus does not promptly and permanently contract after the escape of the liquor amnii, an ample space is afforded for a further extravasation of blood. That this is true is shown by the united testimony of all who have been quoted. Having advised the removal of the liquor amnii, they, with one accord, tell us how great is the danger of further accumulation of blood. A very limited space will afford room for a dangerous extravasation. Another danger is from a more extensive detachment of the placenta when the uterus is even temporarily contracted. This can not be better expressed than in the words of Schröder, who says: "When the uterus is partially emptied of its contents the placenta is partially or entirely separated by the contractions of the uterus far more frequently than by other causes." "We know that, physiologically, after the birth of the child the placenta is separated by the contractions of the uterus." "The same takes place very easily when the volume of the uterus is greatly diminished before the child is entirely delivered and especially when very much liquor amnii was present, or the whole quantity has flowed off suddenly, or in twin cases after the birth of the first child."

While not admitting the full force of this statement of Schröder's, owing to a non-belief in the liability to strong uterine action in these cases, it is certainly true that increased danger may arise in the way he mentions.

Another objection to the early removal of the liquor amnii in accidental hæmorrhage is, that an obstacle is created to the use of the most efficient method for securing dilatation of the os—i. e., by the dilators. Their use would be improper, lest, acting also as a tampon, they should prevent egress of effused blood, and add to the accumulation.

A fourth danger will be from the increased difficulty encountered in the performance of version if the child is not surrounded by liquor amnii. This operation is often imperatively demanded in the treatment of accidental hæmorrhage, under circumstances, too, when its ease of performance is of great importance.

There is one class of cases of accidental hæmorrhage in which the amount of blood lost does not fully explain the degree of shock. In these the factors in the production of collapse are the over-distention of the uterus and consequent irritation of the peripheral nerves of that organ, as well as the abstraction of blood from the circulation.

Here, then, we might believe, was found sufficient ground for the treatment by early rupture of the membranes, relieving thereby uterine distention and the resulting irritation to the nervous system. Upon consideration, however, we find, first, that it is impossible to prejudge in these cases. It is only *after* delivery, when the amount of effused blood can be estimated, that we discover that the shock was proportionately greater than the hæmorrhage. Again, collapse brought about in this way does not obstinately refuse to yield to treatment, but will be remedied usually by the customary measures, such as stimulants, the application of external heat, etc., without the need of any decided local interference. Finally, this variety of the accident is not very common, as indicated by clinical records, the possibility of its occurrence being so lightly regarded as hardly to be mentioned by writers.

What, then, should be the treatment looking toward the safety of mother and child when immediate delivery can not be resorted to, owing to incomplete dilatation of the os?

With the same decision which has characterized the advice of other writers to rupture the membranes as the first step, I should say: by all means *preserve them intact*, and thus tampon the uterine cavity with liquor amnii. Then, while deprecating, in the main, any advice tending toward routine treatment, I should say, in the great majority of cases, employ Barnes's dilators until the desired result is obtained. By them dilatation will be brought about with less irritation of the nervous system, and consequent aggravation of shock, than by any other means, and at the same time their action is most speedy. It can be added, certainly, that there is no safer obstetric operation than dilatation by such means, and that they add the advantage of serving as tampons, if that adjunct to the treatment is required, at a time when it may be of service. Following hæmorrhage the os often dilates with remarkable rapidity, so that their employment will be required for a very brief period. It will, of course, be understood that this or any similar treatment must be employed at a suitable time. It must not supersede efforts for the relief of collapse, and it may be necessary to defer all operative measures until the patient can be rallied from the alarming constitutional symptoms.

The os being sufficiently dilated to enable delivery to take place, rupture of the membranes is proper, and should be followed by manual efforts to compel the uterus to descend upon the child, whose expulsion should be immediate.

Version fulfills the indications better than the forceps, as by the former operation there is less danger from delay during delivery, and because it can be successfully resorted to at an earlier period in the dilatation of the os than the forceps can. Bimanual version should not be considered for a moment, as in cases apparently most favorable it can not always be accomplished, while in this accident the irregularity of the internal uterine surface caused by the collection of blood would certainly interfere with the change of position of the child.

During the entire time stimulants must be freely used and warmth to the surface, and in exceptional cases, when the hæmorrhage does not appear to be continuing, it is proper to wait for returning vitality before operative measures are undertaken, lest the condition of collapse be aggravated.

The danger is not necessarily over after delivery, for it is often difficult to bring about reaction from the dangerous condition, and convalescence will often be slow.

In closing, let me offer an explanation for devoting so much time to a single point in the treatment which may appear trivial at first thought. Accidental hæmorrhage in its severe form is a rare complication, and, as such, would lead many who might meet with it to refer to authorities for ideas relating to its treatment. The result would often be the resort to a method—early rupture of the membranes—which I hope I have shown to be both unsatisfactory and dangerous. Others, who might decline to accept such advice, would certainly be perplexed to find the advice so generally given.

It is well known that many ideas upon pathology and treatment in every branch of medicine are to be found stated almost verbatim in the text-books of successive decades. It can readily be believed that in the rarer morbid processes, the experience of one individual being necessarily restricted, *erroneous* views may be accepted and indorsed without the expenditure of much thought upon a given subject. Each indorsement strengthens the theory until there is a unanimity of belief against which we are not disposed to argue. Even mathematical mistakes, those of addition and subtraction, in statistical tables have been seen reproduced repeatedly, owing to want of thought and attention.

A MODIFICATION OF LISTER'S ANTISEPTIC DRESSING.*

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In a paper on Lister's "Antiseptic Method of Treating Surgical Injuries," which appeared in the "American Clinical Lectures" † for 1878, I called the attention of the profession to a modification of this procedure, which I was then using in the treatment of small wounds, especially those of the hand and fingers. I have since continued its use, and have found the results, in a large number of cases, so satisfactory that I have deemed it of sufficient interest and importance to justify my calling your attention to it in a short paper this evening.

Although having full confidence in Mr. Lister's antiseptic method, I, like many others, have long recognized the great difficulty that must needs be experienced by the general practitioner in attempting to carry out the minute details of the dressing, and have for a long time been hoping that a more simple method, equally efficacious, might be devised.

Dr. Markoe's "through drainage" was a decided step in this direction—antiseptic in character, simple in detail, and successful in result. This method, however, is appropriate only where drainage is necessary, but, simple and efficient as it is, it requires a certain degree of attention, which, while easy for the hospital surgeon, is not sufficiently so to guarantee its extended use by the physician in charge of a large general practice.

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* Read before the New York Surgical Society, November 8, 1881.

† Edited by Dr. E. C. Seguin, iii, 11, 1878.

Aside from the difficulties incident to the application of Mr. Lister's dressing, it has been found that surgeons in country towns distant from large cities have great trouble, and often are unable, to procure good antiseptic gauze at the time when it is needed. This would not be so embarrassing if, in the first place, the gauze was fresh when obtained from the dealers; and, in the second, if it could be kept for a reasonable time without spoiling. This, however, is not the case. The gauze sold in most of our stores is frequently not in an antiseptic condition. As to its keeping fresh, Dr. R. F. Weir has demonstrated* conclusively that even when kept wrapped up in rubber cloth and in a box it will deteriorate in a few months.

In assisting in surgical operations, I have in several instances found that the gauze used had no odor whatever of carbolic acid, although it had just been purchased from a responsible dealer in this city. In my own practice I have been obliged to depend for a reliable gauze on the kindness of the authorities of one of the hospitals with which I am connected.

Furthermore, the materials necessary for fully applying Mr. Lister's dressing are somewhat expensive, a very important fact when we consider that the majority of accidents and operations that call for this procedure occur among those who are able to bear but little expense.

I have for several years been surgeon to a large factory in this city, in which three thousand hands are employed, and where injuries by machinery are quite frequent. These injuries consist chiefly of wounds of the hands and fingers, caused by their being caught in the cog-wheels and other parts of the machinery. In many cases the fingers are torn off, tendons are pulled from their sheaths, joints are opened, and the hands are often severely crushed and lacerated. In all of these cases I have, for the past six years, been using the following simple antiseptic dressing: Having put the parts in a condition for dressing, I wash the wound in a solution of carbolic acid of the strength of one to twenty; I then cover the parts with a thick layer of borated cotton, and then snugly and evenly apply a simple gauze bandage. At first I used bandages made of antiseptic gauze, but for the past three years have used those of plain uncarbolized cheese-cloth. These thin bandages distribute the pressure more evenly over the cotton, and are more easily saturated with fluids than those made of unbleached muslin.

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* "N. Y. Med. Jour.," Jan., 1880, article "Remarks on Antiseptic Dressings."

The patient is instructed to keep the outside of the dressing wet with a solution of carbolic acid of the strength of one to one hundred. I frequently employ Squibb's solution of impure carbolic acid, which is of the strength of one to fifty, and which, when mixed with an equal bulk of water, gives a solution of the desired strength.

The parts should be kept at rest, and the dressings may be left undisturbed for several days, unless there is pain, rise of temperature, or discharge through the dressings. These conditions are always to be considered indications for redressing.

In many cases where rubber drainage tubes have been used they may be removed at the second dressing, and, if catgut has been used for sutures, this second dressing can be allowed to remain on for an indefinite period. In a number of cases of lacerated wounds I have allowed the first dressing to remain on until the wound has entirely healed. In these cases the external use of carbolic lotion was discontinued after the fifth or sixth day, and the dressings would become dry and hard, the wound healing, as it were, "under a scab."

The patient should be instructed to loosen the bandage at once if any pain occurs.

My experience with this dressing covers, as I have said, a period of about six years, during which time I have treated nearly three hundred cases of open wounds. Not one of this number has been followed by inflammatory symptoms. Extensive lacerated wounds have healed, and dead tissue has sloughed away, without giving rise to any of the so-called symptoms of inflammation. Neither pain, redness, heat, swelling, nor constitutional disturbance has resulted. In no case has there been reddening of the lymphatics or tenderness of the glands. No counter-openings have been necessary. Pain has been entirely absent, so that anodynes have not been needed, save in a single case, and that for one night only, to control slight restlessness.

These results are the more remarkable from the fact that many of these patients were in an unhealthy condition, some suffering from anæmia, some from cardiac disease, phthisis, and the like.

Recently I used this modified dressing in St. Vincent's Hospital, in a case of amputation of the leg. The history of the case is as follows:

The patient, a boy nine years of age, was run over by a dummy engine, on September 28th. His left foot was crushed so that it was necessary to amputate the leg at the junction of the middle with the lower third. The operation was performed by Dr. John F. Luby, the House Surgeon, in my presence. The method of amputation was that by lateral skin flaps and circular incision through the muscles. All the details of Lister's method were employed except the spray. Catgut was used for ligatures and sutures. Short drainage tubes were placed in the anterior and posterior angles of the wound. After the wound was washed with a one-to-twenty solution of carbolic acid, it was dressed with several layers of dry borated cotton and a gauze bandage was applied. The outside of this dressing was kept constantly wet with a one-to-forty solution of carbolic acid.

The great and the second toe of the right foot were also crushed, so as to require amputation at the second joint of the great toe and at the metatarso-phalangeal articulation of the second toe. These wounds were dressed in the same manner.

October 2d.—Four days after the operation. Patient has not complained of any pain. His highest temperature has been 99·8° F. Has slept well, and has a good appetite. On removing the dressing, the cotton was found not to have been wet through by the carbolic-acid lotion. The layer in direct contact with the wound was saturated with a watery discharge. The wound was in a perfect aseptic condition. The drainage tubes were removed and fresh borated cotton was applied.

October 7th.—The boy has been perfectly comfortable during the past five days. On removing the dressings very little discharge was found on the cotton. The wound was entirely healed, except at the points where the drainage tubes were inserted. The external application of the carbolic lotion was discontinued.

October 15th.—Dressings removed, and the wound found to be entirely healed, except at a small point at the lower angle. The wounds of the right foot were dressed simultaneously with that of the stump. Although a small portion of the integument sloughed, there was no trace of inflammatory action. Granulations sprang up and the wound rapidly closed, so that on October 17th the cotton dressing was discontinued and unguentum resinæ was applied.

This case did as well as any case could have done under the most rigid Lister dressing.

The value of cotton-wool as an antiseptic dressing is, I think, not fully appreciated by the profession. M. Guérin, of Paris, in 1872, and since then Mr. Gamgee, of Birmingham, England, have called attention to its great value. Used in the way I have indicated, it seems to me to be as perfect an antiseptic dressing as the gauze and other materials recommended by Mr. Lister, while at the same time it is free from all objections that pertain to the latter, and which materially hinder their use by the general practitioner. If applied in sufficient quantities around an open wound, it protects it thoroughly from the "floating matter of the air" which is supposed to be the real inciter of suppuration. It is the best germ filter known to us. Tyndall, whose experiments were very carefully made, found that while filtering the air, and endeavoring to get it perfectly pure, atmospheric dust, which would readily pass through sulphuric acid and a strong solution of caustic potash, was completely stopped by ordinary cotton-wool.

I have used the very excellent borated cotton made by Mr. am Ende, of Hoboken, containing 15 per cent. of boracic acid.* Keeping it wet externally with the solution of carbolic acid, in the manner already described, renders it more surely antiseptic.

To insure success in the cases where the dressing is used, full precautions as to rendering the instruments, sponges, and the hands of the surgeon aseptic, and the use of drainage tubes if necessary, should not be neglected. Catgut or torsion should be used to arrest hæmorrhage. The spray may be resorted to, if thought necessary, at the second dressing. I now usually apply carbolized oil, of the strength of one to twelve, to the wound to facilitate the removal of the cotton, which is otherwise apt to adhere after the first dressing.

I would state, in conclusion, that my experience thus far seems to show that this simple dressing, so easy of application, is as thoroughly antiseptic as Mr. Lister's appliances, and that it has the very decided advantage of doing away with the necessity for using costly "protective oil-silk," "Macintosh cloth," "carbolized gauze," etc., and gives us a dressing that can be used by any one under any circumstances, be it in the city or in the country. The borated cotton is easily kept for months unchanged. The fact that the dressing need not be done oftener than once in several days will especially commend it to the country physician.

The success of this procedure in the treatment of large wounds after accident or amputation will increase its importance, and materially extend its field of usefulness.

* A great deal of the so-called borated cotton sold by dealers is made with a solution of borax, instead of boracic acid, which can always be ascertained by burning a piece of the cotton; if the cotton has been properly prepared with boracic acid, the flame is of a bright-green color, but, if, as is generally the case, borax has been used, the flame will show very little of the green tint.

THE CORPUSCULAR ELEMENTS OF THE BLOOD; THEIR ANATOMY AND PHYSIOLOGY, NORMAL AND PATHOLOGICAL.

By ALEXANDER DUANE, M. D.

(*Continued from November number.*)

The *treatment* of anæmia is to a great extent causal. The errors of diet, digestion, and assimilation once remedied, or the waste of nutrition arrested, the blood soon returns to the normal state. Of more immediate application are drugs which aim to increase directly the solid constituents of the blood. First among these is iron. The rationale of the action of this agent is by no means certain. While by many it is claimed to be a real corpuscular food, supplying to the blood cells the one essential material in which they were deficient, it is considered by others to owe its restorative powers to its effect as a stomachic tonic. Opinion is also divided as to the amount required to produce a beneficial effect, some recommending a high dose and using the more powerful preparations, others contending that a few grains a day of the milder preparations are fully as useful and much less irritating. In many cases of gastric disease iron causes harm by the disturbance of digestion which it occasions, and it has accordingly been proposed to administer it hypodermically. But this inconvenience can in general be avoided by the careful use of the milder preparations. Manganese is often associated with the iron, with the idea of increasing the efficiency of that agent. It is said to be itself contained in the corpuscles to a slight degree. However this may be, it seems to add little to the effect of the iron, and is by some accounted injurious in its action. Arsenic is often serviceable, and seems to act by improving nutrition. The same is true of cod-liver oil, which has been shown by Elbridge and Cutler to have a marked effect in increasing the number of red corpuscles. The use of tonics and the enforcement of exercise, bathing, and good hygiene tend in the same direction. The management of the diet is, of course, of the greatest importance in a disease which has its basis in disordered nutrition.

Toxic Anæmia.—Under this head are grouped a number of conditions in which the blood cells are destroyed by the influence of some agent which affects them while they are still circulating in the vessels. An enumeration of such agents has already been given and need not be repeated. It will be sufficient to consider briefly one or two sets of symptoms which may be occasioned by the intravascular destruction of the erythrocytes.

Hæmatogenous jaundice has been defined to be a morbid state resulting from the development in the blood of a pigment resembling the coloring matter of the bile. This pigment, like all others in the body, is supposed to be derived from the solution of a number of the erythrocytes and the metamorphosis of their hæmoglobin. It may be caused by the entrance into the blood of any of the corpuscle-dissolving substances, such as water, ether, chloroform, the biliary salts, arseniuretted hydrogen, phosphorus, and the poison of serpents; also by the presence in the blood of septic material, as in some cases of pyæmia, puerperal fever, and pneumonia. The pathology and symptoms, apart from the presence of the yellow pigment in various parts of the body, present little that is distinctive. It has been remarked that the blood corpuscles of patients suffering from jaundice are more resistant to the dissolving action of water than is usual in other diseases. Lépine, who observed this fact, ascribed it to the previous destruction of all the less resistant corpuscles by the agent to which the jaundice itself was due.

Hæmatogenous is to be diagnosticated from liver jaundice by the absence of any occlusion of the biliary passages, the presence of a sufficient exciting cause, the natural color of the fæces, and the scanty amount of biliary matters found in the urine. None of these points of difference, however, are sufficiently diagnostic to admit of a precise separation of the two affections; and it must be allowed that many cases of jaundice which were formerly held to originate in the blood are now considered to be hepatogenous in character. But it would be wrong to conclude from this that a purely hæmatogenous jaundice does not exist; for there are cases which undoubtedly do arise in the blood, and which justify our separation of this form of disease from the more common hepatic variety.

Paroxysmal hæmoglobinuria[*] is an affection characterized by recurrent paroxysms, during which the urine becomes charged with free hæmoglobin. In nearly every case it seems to be excited by exposure to cold, although any agent which will produce hæmatogenous jaundice may also cause hæmoglobinuria (arseniuretted hydrogen, pyrogallic acid). There is considerable dispute as to the pathology of the disease. Some maintain that the destruction of the corpuscles takes place in the vessels, and that the hæmoglobin thus set free goes into solution and escapes by way of the kidneys.[†]

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[*] Also called "intermittent hæmaturia" (Harley, Dickinson, 1864); "paroxysmal hæmaturia" (Pavy); "winter hæmaturia" (Hassal, 1865); "intermittent cruenturesis" (Thudichum); "periodical hæmoglobinuria" (Lichtheim and others); "hæmoglobinuria a frigore" (Mesnet, Lépine, Ramlot).

[†] Lichtheim, "Periodische Hämoglobinurie," in Volkmann's "Samml. klin. Vortr.,"

The arguments in favor of this view are that a hæmatogenous jaundice frequently exists simultaneously with the hæmoglobinuria, and that examination of the blood shows the presence of corpuscular fragments and other evidences of disintegration. The latter, however, are by no means constantly present, and Ehrlich [*] therefore suggests that exposure to cold effects a change in the physical constitution of the blood corpuscles by which the hæmoglobin can escape without rupture of these bodies.

Others reject entirely the idea of a hæmatogenous origin, and suppose that the corpuscles pass without rupture into the urine and are there dissolved. But the urine after it has left the kidney has such a degree of concentration that it exerts rather a preservative than a destructive action upon the red blood cells, and accordingly Lépine [†] conjectures that these bodies, having made their way into the interior of a Malpighian capsule by rupture of a vascular tuft, may there become dissolved in the urine, which in this locality has not yet received its solid constituents, and is therefore exceedingly dilute. The English authors, along with Bartels, Kiel, and Botkins, ascribe the occurrence of the hæmoglobinuria to the congestion of the kidney caused by the revulsion of blood from the cutaneous surface to the internal organs. That such an internal congestion really occurs is argued from the enlargement of the liver observed to take place during the paroxysm. Silvestrini and Conti,[‡] having found changes in the liver in all cases, regard the disease as occasioned by a peculiar variety of parenchymatous hepatitis, while Rosenthal, Eulenburg, and others attributed the hæmoglobinuria to a disorder of the nervous system.

At the moment of attack the blood is said to become like that of inflammation, the fibrinous network being increased and holding the white corpuscles fixed in its meshes, while the red cells are more closely packed together (Hayem).

The symptoms of the affection are characteristic. Periodically recurring paroxysms are separated by intervals of health during which no morbid changes can be detected in the blood or other

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No. 134; Ramlot, "Rev. Mens. de Méd. et de Chir.," Sept., 1880; Murri, "Rivist. Clin. di Bologna," Feb. and Mar., 1881. The latter author believes that the conditions necessary for the induction of paroxysmal hæmoglobinuria are: (1) an abnormal state of the cytogenous organs (generally due to syphilis) by which the corpuscles are formed, with a diminished power of resistance to disturbing agencies; (2) a morbid condition of the vaso-motor centers, which under the stimulus of cold causes the cutaneous vessels to be dilated. The blood in the peripheral circulation, being thus chilled and becoming rich in carbon dioxide, reacts destructively on the congenitally enfeebled corpuscles.

[*] Quoted by Lépine, who supports his view.

[†] "Rev. Mens. de Méd. et de Chir.," May, 1881.

[‡] "Gazz. Med. Ital. Lombard.," 1881, No. 7.

parts of the body. A paroxysm is brought on by exposure to cold, and in rapidity of appearance and in intensity is proportional to the degree of cold experienced. It is ushered in by a feeling of *malaise*, headache, and vertigo, with a painful sense of tightness in the epigastrium, a marked feeling of cold in the feet, and slight general chilliness.* At the same time the pulse rises 1–2° C., and the pulse is accelerated. Then a quantity of urine is discharged, varying in hue from dark red to black. This always contains albumen, and in fact the latter substance makes its appearance in the urine before the hæmoglobin. Spectroscopic examination of the urine gives the characteristic absorption bands of hæmoglobin. Under the microscope decolorized fragments of blood cells may sometimes be made out; but these are usually absent at the height of the paroxysm. The attack lasts from six to eight hours; the urine, which has gradually deepened in hue till it has become almost black, again grows lighter by degrees, and the temperature and pulse return to normal.

Some authors have regarded as instances of this disease cases which were evidently examples of hæmaturia from disease of the urinary tract. The distinction is, however, sufficiently easy both from the history of the case and from an examination of the urine, which in hæmaturia shows an abundance of uninjured corpuscles, associated frequently with pus cells and mucus.

Little has been said by authors in regard to the treatment of paroxysmal hæmoglobinuria. Stolnikon † cured one case by the subcutaneous injection of quinine; Murri, in accordance with his views of the etiology of the disease, recommends an anti-syphilitic line of treatment.

Melanæmia is a morbid condition characterized by the presence of pigment in the blood. It is almost always secondary to chronic malarial disease, and occurs generally after the spleen has become markedly hypertrophied. In its nature it is probably to be regarded as an instance of the physiological process of destruction of the erythrocytes carried to a pathological excess, from undue stimulation of the cell-destroying function in the spleen. Possibly also there is a failure on the part of cell-forming organs to appropriate as usual the pigment resulting from the destruction of old corpuscles for the renovation of the new. Again, it is possible that the repeated febrile paroxysms of the malarial disease lessen the resisting power of the red cells so that they are more readily disintegrated by morbid agencies.

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* This description is mainly derived from Mesnet, "Arch. Gén. de Méd.," May, 1881.

† "St. Petersb. med. Woch.," 1880, 27, 28.

The presence of pigment in the blood is especially marked during and just after a malarial paroxysm. It occurs either in the free state as separate granules, or in the form of large irregular masses; or it is more frequently found enclosed in cells, which may be either the ordinary white blood corpuscle or large fusiform masses resembling the sickle-shaped cells of the splenic veins. The pigment is usually black, but may be brown or yellowish. It is found in the blood of all parts of the body, but more especially in that of the portal and splenic veins, and it also occurs as a deposit in the substance of organs, especially in the spleen, liver, and bone-marrow. Other parts of the body which are more seldom affected are the brain, kidneys, and lymphatic glands.*

The symptoms, apart from those of the fundamental disease, are such as might be produced by capillary obstruction in the various organs from impaction of the pigment matter. Thus, as the results of cerebral embolism, there may be headache, vertigo, delirium, convulsions, and coma; from renal infarction, albuminuria, hæmaturia, and suppression of urine; from portal obstruction, diarrhœa, intestinal hæmorrhage, and ascites. But, while all these symptoms do actually occur, it may be fairly questioned whether they are not, after all, due to the direct effect of malarial poisoning rather than to capillary embolism of the organs in question.

The prognosis and treatment are necessarily those of the primary disease; the former may in general terms be stated as serious, the latter as comprised in the usual treatment of malarial affections.

Another variety of toxic anæmia is occasionally observed as the result of excessive heat, as in *burns*. Wertheim and Simon † have found fragmentary corpuscles (microcytes) floating in the blood in such cases. Lesser,‡ indeed, thinks that death after burns is to be attributed to the direct effect of heat upon the corpuscles, an effect which is shown in alterations of shape, escape of the hæmoglobin, accumulation of pigment granules in the blood, and hæmoglobinuria. The result of these lesions is asphyxia from the destruction of so many oxygen carriers. But excessive heat does not always have this effect, for in four cases examined by Tappeiner # there were no signs of corpuscular destruction and no hæmaturia, but rather a condensation of the blood, such as occurs in cholera, the amount of water being diminished by as much as ten per cent.

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* This and the following paragraph is mainly an abstract from von Niemeyer, "Lehrb der spec. Pathol.," 10th (Seitz's) edition.

† Quoted by Litten.

‡ Reported in "Lyon Méd.," Nov. 14, 1880.

"Centralbl. f. d. med. Wissensch.," 1881, No. 21.

In relapsing fever, in pyæmia, and other conditions marked by a *high temperature*, a certain amount of destruction of the corpuscles appears to take place.

The foregoing include most of the varieties of acute intra-vascular destruction of the erythrocytes. A more chronic form occurs as the result of the action of various *mineral poisons*, especially mercury and lead. How far these act by impairing digestion and assimilation, and how far by a direct action upon the blood cells, can not be certainly determined. The degree of anæmia, however, which in the case of lead poisoning can become very great, is an argument in favor of the theory that they act directly upon the erythrocytes and assist in their destruction.

A final variety of toxic anæmia is that produced by the entrance into the blood of the so-called *respiratory poisons*. These act not by diminishing the number of the corpuscles, but by lowering the respiratory capacity of each cell. As a list of them has already been given, together with the mode in which they act, they do not need a more extended notice here. The symptoms produced by their toxic action are generally limited to a failure of the respiratory function, which is so rapidly fatal that there is no time for the development of further evidences of poisoning or for the administration of any antidote.

Traumatic Anæmia.—This is a term applied to an impoverishment of the blood *caused by hæmorrhage.* The latter may owe its origin to the exaggeration of a physiological process, as in menorrhagia, to accidents connected with pregnancy and the puerperal state, as in abortion, placenta prævia, and post-partum hæmorrhage, to traumatism, to ulceration upon a surface and excavation within an organ, to the development of certain new growths, such as aneurisms, fibroids, and cancer, and to the existence of a hæmorrhagic diathesis.

The *pathological changes* occurring in the blood as the result of a hæmorrhage are: first, a simultaneous diminution in all the elements of the blood; secondly, a restoration of these elements at different intervals of time; and, thirdly, the development of embryonic forms of the red corpuscles. The serum is replaced more rapidly than the erythrocytes; hence, in addition to the absolute anæmia which exists at the time of bleeding, a relative anæmia makes its appearance within the few days following and continues till the corpuscular loss has been made good. The degree to which this relative anæmia may be carried is seen from the following table, quoted by Immermann from Vierordt:

Amount of blood lost in parts of body weight.	Proportion of red corpuscles to 100 of normal.
0	100
1–100	89
1– 47	81
1– 30	75
1– 18	69
1– 17	52 Death of animal.

It will be seen from this table that the serum is only partially replaced.* The individual corpuscles are pale, indicating that each cell has lost a portion of its hæmoglobin, and that the anæmia is both general and corpuscular (oligochromæmia, hypochrosis). On the other hand, the white corpuscles are replaced more rapidly than the serum, and hence appear relatively increased (leucocytosis of hæmorrhage). This increase, which begins to take place before the apparent diminution in red cells has become sensible, may go so far as to produce an absolute excess of white corpuscles in the blood (Hühnerfrauth). Such a rapid replacement of the leucocytes is probably to be referred to the passage of a large amount of lymph from the thoracic duct into the veins to make good the fluid which has been lost (Immermann).

Frequently the red corpuscles are seen to be nucleated and to exhibit fantastic shapes (poikilocytosis).† Large, pale, newly-formed erythrocytes are also found. In the spleen in mammals, and in the bone-marrow in birds, nucleated red corpuscles and other evidences of active cell formation are observed.‡

The blood toward the close of a hæmorrhage becomes more coagulable. The albumen and fibrine, according to d'Arsonval,# are changed into peptones.

It is commonly said that acute fatty degeneration of the heart and other organs may be produced by large or repeated hæmorrhages. Sanguirico,‖ however, as the result of experiments upon animals, denies this.

The *symptoms* of traumatic anæmia differ according to whether it is produced by a single large hæmorrhage or small repeated losses of blood. In the former case the train of symptoms is well known. The surface becomes pale, with a peculiar clay-like hue, the muscles are relaxed and irresponsive to the will, the pulse is soft and frequent, and the respiration is panting. The countenance often expresses extreme alarm, and the constant, restless changes of attitude indicate the distress of the patient and the demand of the whole system for more air. Usually syncope ensues, and this in turn is succeeded by a period of reaction characterized by nausea, frequently associated with vomiting, great thirst, headache, tinnitus aurium, and rapid, feeble action of the heart with palpitation. There is not infrequently some febrile action, which is very irregular in its course, being subject to sudden exacerbations.* If, however, the hæmorrhage is to be fatal, there will be no reaction; but delirium with clonic spasms in the face and limbs sets in; the surface grows cold, the pulse thready, the breathing infrequent and gasping; the heart becomes feebler and feebler, and finally ceases to beat. Even in favorable cases the condition of the patient is a precarious one; the system is greatly enfeebled, and much less capable of withstanding any additional shock; and recovery is correspondingly slow. In fact, the convalescence from a severe hæmorrhage is marked by a variety of ills, prominent among which are nervous irritability, neuralgia of various parts, failure of digestion, and long-continued muscular debility.

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* If we estimate the total amount of blood as $\frac{1}{12}$ that of the body, the value of $\frac{V}{V^1}$, = the ratio of the original volume of blood to the total volume after any one bleeding, will increase from 1 to 1·1, to 1·25, and finally to 2.

† Ehrlich, quoted in "Centralbl. f. d. med. Wissensch.," Nov. 6, 1880; Bizzozero and Salvioli, in "Berl. klin. Woch.," July 26, 1879; Scheperln, in "Rivist. Clin. di Bologna," Jan., 1880.

‡ Bizzozero and Salvioli, *loc. cit.;* Bizzozero and Torre, "Centralbl. f. d. med. Wissensch.," Oct. 2, 1880; Korn, "Centralbl. f. d. med. Wissensch.," Oct. 9, 1880; De Borris, "Sperimentale," Nov., 1880; Litten and Orth, "Berl. klin. Woch.," 1877, No. 51.

# "Gaz. Méd.," March 27, 1880.

‖ "Sperimentale," Nov., 1880.

Traumatic anæmia due to small repeated hæmorrhages presents the same symptoms as symptomatic anæmia.

The *treatment* of traumatic anæmia is, of course, mainly surgical. It includes the arrest of the bleeding, the support of life by tonics and stimulants, and the reparation of the blood lesion, primarily in desperate cases by transfusion, then by the use of nourishing food, and afterward, during the period of convalescence, by the administration of iron.

Pernicious Anæmia.—This is a disease which is essentially characterized by a rapid and progressive diminution in the number of corpuscles, with the production of symptoms of the most profound anæmia, which continually increases in severity and finally causes death. It has been known under a variety of names for a number of years. Thus, as Runeberg points out, it was described in the latter part of the last century by Good under the title of "marasmus anhæmia." The English physicians first brought the disease into general notice, Addison and Barclay describing cases between 1843 and 1855. Lebert in 1853 gave the history of a case under the designation of "puerperal chlorosis," and Wilks in 1857 sketched the disease as an "idiopathic fatty degeneration." Others have called it "essential anæmia," the "extreme anæmia of pregnancy" (Gusserow, 1871), "idiopathic anæmia" (Habershon, 1863), "fatal anæmia" (King, 1871), and the "anæmic form of fatty heart" (Ponfick). Biermer, who had observed one case in 1868, gave in 1871 the first detailed description of the disease, basing his account upon the history of fifteen cases. Lately Lépine* has given a summary of the scattered observations up to the date at which he wrote, and Coupland † has given a very complete description of the disease, founded on the statistics of 110 cases.

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* It is a curious fact that after hæmorrhage there should be an increase in the tissue-metamorphosis of nitrogenous matter (increased excretion of urea). The excretion of carbon dioxide is, however, diminished (Immermann).

Although so much study has been expended on the disease, considerable doubt yet remains as to its *nature.* By some it is regarded as merely an aggravated form of simple anæmia, being induced by any very severe or constant drain upon the system, and Scheperln points out the pathological as well as the etiological identity existing between some forms of traumatic and pernicious anæmia. Indeed, the preponderance of evidence seems to be in favor of considering it as rather a symptomatic than an essential disease. Nevertheless, the exciting causes are generally such as would ordinarily produce only a moderate degree of anæmia, and we must therefore agree with Runeberg that an individual predisposition is necessary in order to give rise to the pernicious variety. Of those who hold to the distinctive character of the disease, some assign a nervous, others a myelogenous, origin. Thus, King, in the case which he observed, regarded the affection as dependent upon a lesion which he discovered in the sympathetic, and Little ‡ suggests that a morbid change in the vaso-motor region of the sympathetic may be the primary cause, the changes in the blood being secondary. Brigidi,# it may be noted, found in one case a lesion of the cœliac plexus. On the other hand, the nearly constant presence of changes in the bone-marrow has led observers to consider pernicious anæmia as due to a disturbance of the blood-forming organs, and Pepper regards it as a myelogenous pseudo-leucæmia. But the fact that these medullary lesions occur in the most diverse forms of disease, some of which are evidently not due to their agency, would show that they are the result rather than the cause of the blood changes.

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* "Rev. Mens. de Méd. et de Chir.," 1877.

† In the several numbers of the "Lancet" appearing during April, 1881.

‡ "Med. Record," Mar. 20, 1880.

Cited in "Rivist. Clin. di Bologna," Aug., 1880. The case, however, was certainly not one of pernicious anæmia.

Again, observers are in dispute as to whether the anæmia depends upon an excessive destruction or a deficient formation of red cells. Scheperln argues for the latter view, since the diminution in urea which exists indicates a depression in the activity of tissue-metamorphosis. With him agree Hansen and Lodi.* Yet there seem to be cases in which excessive destruction of the corpuscles forms the basis of the blood impoverishment.

The *etiology* of the affection is somewhat unsettled. In many cases no satisfactory exciting cause could be detected. The list given by Eichhorst probably covers most of the causal factors, and includes pregnancy and parturition, especially if oft-repeated, lactation, successive hæmorrhages, and diarrhœa. The first-mentioned cause appears to be the most important, 20 out of the 110 cases collected by Coupland being ascribed to its influence, while 11 were brought on by bad food and defective hygiene. Other cases were induced by nervous care and worry. Malaria, yellow fever, and typhoid fever seem to have acted as predisposing causes in a few instances. Occupation seems to exert an influence, as Ruhle mentions a form observed in brick-makers, while another variety is described as prevalent among mountain-climbers. Finally, a form was developed among the laborers in the St. Gothard Tunnel, where the disease was found to depend upon the presence of an intestinal parasite.

As to the influence of age, it is found that, while in men most cases occur after forty, in women the reverse holds good. The connection of the disease with pregnancy and lactation explains why with women it should be most prevalent before the child-bearing age has passed. It is present about equally in both sexes.

The *pathology* of progressive pernicious anæmia includes in general the same changes in the blood which are met with in simple anæmia, as well as changes in the bone-marrow and in the various organs of the body. The most marked feature among the blood lesions is the great diminution in the number of erythrocytes and in the quantity of hæmoglobin. Both these constituents may fall to one half, one third, or even one sixth of the normal. Even this limit is exceeded, and a reduction to one tenth is now and then observed. Quincke in one case found the number of corpuscles diminished to one thirty-fifth of the normal (143,000 in a cu. mm.), and Fenoglio † reports one instance in which the blood corpuscles had fallen to one thirty-eighth of the usual amount. These represent probably the most extreme degree of cell poverty compatible with life. Besides the diminution in number, the erythrocytes frequently display anomalies in size, shape, and physical characteristics. The occurrence of both abnormally large corpuscles and of microcytes has been often remarked (Eichhorst, Quincke, Bell and Osler, Noder, Bischoff, Mackenzie, and Litten). Indeed, Eichhorst regarded the presence of microcytes as pathognomonic of the disease; but this is certainly not the case, as these small cells have been observed under other pathological conditions. Moreover, they are not of constant occurrence in this condition, having been absent in two cases observed by Leichtenstern. Hayem finds an unusually large number of hæmatoblasts,* which, allowing his explanation of blood-formation to be correct, would be corroborative of the theory that the disease is due to an arrested development of the red corpuscles. If, however, his hæmatoblasts are regarded as identical with the microcytes of other observers, and so represent the disintegrated fragments of the blood cells, their presence forms an argument for the hypothesis that the disease consists in an increased destruction of the erythrocytes. Perhaps an additional argument for this latter view is found in the statement of Hayem that the white corpuscles are more or less tinged with hæmoglobin, which they have presumably derived from the breaking up of the red cells. A more direct evidence of the fragility of the erythrocytes is seen in the anomalies of form which they present. This occurrence of poikilocytosis has been remarked by several observers (Scheperln, Noder, Bell and Osler, Bernheim, Ruhle, Kant, and others), and has been made the subject of special study by Quincke. The latter describes the following variations: Grouping into irregular masses instead of forming the usual coin-like piles; rapid appearance of crenation; assumption of a pyriform, globular, or biscuit shape; eccentric disposition of the central depression; accumulation of the coloring matter in one portion only of the cell. In two cases mentioned by Litten the central depression was so deeply excavated as to appear punched out, and the corpuscles looked like rings. In one case Scheperln observed amœboid movements in the irregularly-shaped cells, furnishing an additional proof of the corpuscular instability.

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* "Riv. Clin. di Bologna," Feb. and Mar., 1880.

† *Loc. cit.*

On the other hand, the presence of nucleated red corpuscles in the blood is to be regarded as an evidence of arrested development, and so is corroborative of the theory which bases the disease upon a diminished formation of the erythrocytes. According to Ehrlich, it is the large nucleated cells (megaloblasts) which preponderate in pernicious anæmia. These megaloblasts do not throw off their nuclei entire, as do the small nucleated cells found in ordinary anæmia, but lose them by a process of intra-cellular degeneration. Nucleated cells, however, are by no means of constant occurrence in pernicious anæmia, and, according to some authors, they are never present at all, those who assert the contrary being the victims of some optical illusion. Hayem, for instance, believes that those who think they are witnessing a nucleated red corpuscle have under view only an ordinary white corpuscle rather deeply stained with hæmoglobin.

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* "Gaz. Méd.," Mar. 6, 1880.

The white corpuscles may or may not be increased in number. Other alterations in the blood are rare. Masses of granules are sometimes seen, and bacteria have been noticed. But as the latter were seen in the blood after death, when bacteria are liable to occur under any circumstances, the observation loses any significance which may have been attached to it. The total amount of blood is diminished, as was shown in two cases which Quincke tested by the method already given of counting the corpuscles before and after transfusion.

The changes occurring in the bone-marrow, and described by Cohnheim, have been regarded by some as pathognomonic. They consist chiefly in a replacement of the fatty marrow by the red or lymphoid variety, in the development of numerous transition forms between the embryonic and the fully-grown erythrocytes, and in the occurrence of degeneration forms of the latter. For reasons already given, these changes are regarded as rather the result than the cause of the blood lesion, and in any case are not distinctive of the disease. They probably represent an attempt at reparation of the loss of material from the blood, since they may frequently be observed after a severe hæmorrhage.

The other lesions belonging to the disease consist chiefly in a fatty degeneration, which may affect the liver, kidneys, and alimentary canal, and which is nearly constantly present in the heart (Coupland). The latter organ is often in a state of dilatation. The aorta is found to be contracted in some cases. Pigmentation of the liver and hepatic capillaries (siderosis) was found by Quincke, and was ascribed by him either to increased destruction of the old red corpuscles or to diminished appropriation of their hæmoglobin for the formation of new cells. Finally, among the pathological changes arising from the disease are to be included the appearance of pallor and emaciation due to the general failure of nutrition, as well as the lesions of the complications, such as œdema, dropsy, and hæmorrhage into various parts of the body.

The *symptoms* are in general those of a simple anæmia carried to an excessive degree of severity. The invasion may be gradual or sudden. The initial symptoms are pallor, muscular debility, digestive troubles associated often with excessive thirst, cardiac palpitation with a tendency to syncope, dyspnœa on exertion, headache, vertigo, ringing in the ears, and multiform nervous disturbances. All these troubles are usually progressive; the cardiac symptoms become more marked, the dyspnœa constant, the nervous disorders more harassing. The sleep is frequently disturbed, and delirium may occur, which toward the end may be succeeded by convulsions. Further, a severe and obstinate diarrhœa is the frequent accompaniment of many cases. As the disease goes on, a tendency to the formation of a hæmorrhagic diathesis is developed, which makes itself apparent most often in the form of retinal hæmorrhages. So frequently does this latter symptom occur* that it has been considered to be characteristic of the disease. The effusion of blood is regarded by some as due to the rupture of the retinal vessels, but Scheperln found in only one case any alteration of the vascular walls, and therefore ascribes the hæmorrhage to a simple diapedesis. A form of inflammation (retinitis anæmica) appears to be excited by this extravasation. † Less frequently hæmorrhages occur in other parts of the body, as epistaxis, menorrhagia, intracerebral and sub-dural extravasation, petechiæ, and sub-peritoneal effusions. Œdema and dropsy also appear late in the disease, partly as a result of deficient heart power, partly on account of the facility offered to transudations by the nutritive alterations taking place in the walls of the vessels.

A sign upon which some stress has been laid on account of its supposed diagnostic importance is a tenderness excited by pressure over the sternum and other bones. It is not, however, of constant or even of very frequent occurrence.

Fever is generally, though not invariably, present. Like anæmic fever from other causes, it is very irregular in course and subject to sudden exacerbations. Yet, in spite of the increased temperature, there is diminution of tissue-metamorphosis, as shown by the decrease in the amount of urea excreted. It is a remarkable fact that, while in other respects the patient may present all the signs of anæmia and debility, his external appearance is that of one who is fairly nourished and who possesses a good amount of fat.

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* Quincke found it to be present in 24 out of 31 cases, while in 15 cases observed by Scheperln it was present without exception.

† Uhthoff locates the hæmorrhage especially in the layer of nerve fibers and the intergranular layer. In half the eyes which he examined there was varicose hypertrophy of the nerve-fibers. See abstract in "Centralbl. f. d. med. Wissensch.," 1881, No. 18.

The chief objective signs, besides the general aspect of the patient and the evidence furnished by an examination of the blood, are the cardiac and venous murmurs, which are similar in origin and character to those found in ordinary anæmia. Examination of the urine shows a diminution in the urea and uric acid, but generally no other abnormalities, except sometimes the presence of albumen. The presence of iron has also been noticed in one instance.

The *course* of the disease is usually unremitting. The gastric, cardiac, respiratory, and cerebral troubles steadily increase until the patient is brought into a very pitiable condition, in which he suffers from continual dyspnœa and palpitation, from distressing vertigo and headache, and from complete muscular prostration. Nevertheless, this is not the invariable rule. In nine cases observed by Runeberg,* the course was discontinuous and marked by periods of spontaneous improvement. The duration varies; in some being only a few months (34 per cent.), in others (26 per cent.) from six months to a year, in others, again (27 per cent.), from one to two years, and in the remainder two years and more (Coupland).

The *prognosis* is bad, though not absolutely so. Indeed, out of 110 cases, Coupland records 20 that ended in recovery. But many of these so-called recoveries were probably mere delusive intermissions in the disease, the cases not having been under observation long enough to justify the formation of a positive opinion. Different symptoms to which a prognostic value has been assigned seem not to bear such an interpretation. Thus, it was thought that when the hæmoglobin was reduced below one fifth of the normal a fatal termination was inevitable; but in several cases a much lower limit was reached, and yet a cure was effected.† Again, the retinal hæmorrhages which were considered to be a sign of fatal import are not invariably so.

The *diagnosis* of the disease is often difficult. Scheperln thinks that he has discovered transition forms between pernicious anæmia and both leucæmia and pseudo-leucæmia which render it especially hard to distinguish between these three affections. Moreover, it is quite impossible to diagnosticate some cases of cancer of the stomach and intestinal ulcer from pernicious anæmia.‡

The *treatment* is mostly without result. The drugs which have met with the greatest success are arsenic and iron, aided (in a case of Lachmann's)[*] by large doses of quinine. Dietetic and supporting measures are also of service. Transfusion of blood has been resorted to, for the most part with but little success. In the hands of Quincke, however, it is said to have been efficient in the cure of five cases.

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* "Dtsch. Arch. f. klin. Med.," May 25, 1881.

† Quincke, reported by Coupland; Kant, "Lancet," Jan. 1, 1881; Hansen.

‡ Scheperln; see also a case which occurred in Bellevue Hospital and was reported in the "Med. Record," Jan. 12, 1878.

(*To be continued.*)

CHRONIC GENERAL PERITONITIS.[†]

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The following case seems to me not only to exemplify a condition which Flint classes "among the curiosities of medical experience," but to present other clinical and pathological features worthy of remark:

Mr. A. B., aged 69, a lawyer of eminence, came under my care September 9, 1879, suffering from ascites. The patient was a man of fine physique, who, despite great intellectual labor in former years, had enjoyed good health, with the exception of autumnal catarrh, during an active professional career. About eighteen months before I saw him he was attacked by what his medical attendant at that time diagnosticated as pleurisy on the left side. With this he had great pain "around the waist," much aggravated by breathing or coughing, but without abdominal tenderness lower down. Some time after this, ascites began to manifest itself, very gradually at first, but increasing until, about three months prior to my visit, a practitioner whom he consulted while on a trip to the White Mountains advised and performed aspiration. There had been no jaundice at any time. The family history was good on both sides, excepting a neurotic element in the paternal descent. The patient's personal habits had always been abstemious in all respects.

Condition on Examination.—Abdomen much distended with fluid; respiration mechanically embarrassed; no tenderness on percussion or manipulation. Heart sounds normal; pulse 69; sphygmogram normal. Lungs resonant above, but condensed at bases. Urine of sp. gr. 1·020, free from albumen or bile, containing 5·4 grains of urea to the fluidounce, with slight excess of phosphates; a few crystals of triple phosphate; no casts nor other anatomical elements. Temperature normal; appetite good; bowels rather constipated; stools pale-colored. I aspirated 368 ounces of fluid, of sp. gr. 1·012. The operation was followed by some colicky pains, but no tenderness or rise of temperature. The distention being relieved, the extent of liver-dullness was found slightly diminished, and there were evidences of pleuritic thickening at the left base.

My diagnosis, based upon the rather meager past history, and upon the present signs, was chronic general peritonitis, probably originating from a perihepatitis following diaphragmatic pleurisy.

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[*] "Berl. klin. Woch.," Bd. xviii, 1881, p. 101.

[†] Read before the Staten Island Clinical Society, September 5, 1881.

The case advanced, month after month, without any marked change in the symptoms. Despite diuretics and occasional hydragogues, the ascites recurred, accompanied by increasing œdema of the lower extremities. On January 2, 1880, I aspirated 336 ounces; on May 28th, 248 ounces; July 16th, 476 ounces; October 19th, 483 ounces. At this time the indications of pelvic pressure increased, beginning with severe sciatic neuralgia and deepening quite suddenly to complete paraplegia, unattended, however, by fever or abdominal pain or tenderness. The palsy gradually passed off in the course of a fortnight, but the œdema of the legs was greatly augmented, extending rapidly to the thighs and genitals. The heart's action was becoming more labored, with occasional intermissions of the pulse, but without signs of cardiac enlargement or impairment of the valvular sounds. On November 29th I aspirated 248 ounces, the fluid coming with more difficulty than usual, and deep fluctuation remaining after it had ceased to flow. On December 28th I again used the aspirator, but was able to withdraw only 56 ounces, the bulk of the fluid being evidently contained in an inner cavity formed by intestinal adhesions. The urine was reduced to about 26 ounces per diem, sp. gr. 1·026; free from albumen or bile; depositing granular urates and triple phosphate in small amount; no casts. The ascitic fluid was of sp. gr. 1·012; reaction neutral; solidifying on boiling; containing no bile-pigment. Microscopic examination showed blood corpuscles, some shriveled, some in *rouleaux*, with leucocytes in abundance, and a few round granular endothelial cells. On January 27, 1881, I was able to reach the main cavity with a fine aspirator needle, and abstracted 597 ounces.

On February 9th the patient passed per rectum a membranous film several inches in length, presenting under the microscope the ordinary appearance of fibrinous exudation. Beyond some discomfort in defæcation and the appearance of rectal obstruction, there had been no indications of proctitis or enteric lesion.

The patient sank rapidly, œdema of the lungs supervening, and death occurred February 23d.

At the post-mortem examination, made 27 hours after death, with the assistance of Dr. W. C. Walser, the principal points of pathological interest were as follows: The abdominal cavity contained about three gallons of serous fluid. The omentum was thickened and inseparably adherent to the abdominal wall in the right hypochondrium. The peritonæum was much thickened and coated with old organized exudates. The liver was cirrhotic; the capsule adherent; tightly bound down on the diaphragmatic surface by a thick, dense, parchment-like layer of organized lymph and connective tissue. The gall bladder was shrunken, containing about an ounce and a half of inspissated bile; the cystic duct was almost obliterated. The spleen was cirrhotic and adherent by thick, tough, organized lymph, as in the case of the liver. The kidneys were normal as to their secreting structure, with several peripheral cysts from the size of a lentil to that of a walnut. The intestines were matted together by adhesions of different dates. The pelvic cavity was almost filled by an exudate of plastic lymph, leaving a canal of not more than an inch and a half in diameter. There was no affection of the retroperitoneal glands, or of the intestinal walls, discoverable.

Chronic general peritonitis, independent of tuberculosis or carcinosis, is either ignored or denied by most medical writers, save as a protraction of an acute purulent attack; and the few authors who recognize its existence differ as to its pathology and clinical history. Flint regards it as generally consecutive, either to a prior affection of the abdominal viscera, or to an affection situated elsewhere, and as being usually either tuberculous or cancerous, adding that the effusion caused by it is seldom enough to require tapping. Niemeyer and Da Costa, while admitting the occasional extension of an acute attack, describe the chronic affection as almost invariably associated with tubercle or cancer; and nearly all the text-books and teachers for several generations past have laid down the same rule. Aitken, however, observes that it may take place to a great extent without much suffering. Rokitansky asserts that it affects the intestine only. Orth, on the other hand, describes it as usually characterized by adhesion between the parietal and visceral layers. Bauer portrays a form of latent general peritonitis evidenced by more or less copious serous effusion "without there being any distinctly marked commencement of the attack," and, while in one breath alleging that this form is so very rare that its existence is commonly denied, rather inconsistently adds his belief that the idiopathic dropsy of the older writers ought to be described as chronic peritonitis. In another place the same author admits the possible origin of peritonitis in an extension of pleuritic inflammation through the diaphragm. Thierfelder also recognizes chronic peritonitis as sometimes giving rise to cirrhosis, the inflammatory process extending from the serous investment and Glisson's capsule to the interlobular structure, and refers to a rare form of chronic hepatitis "in which, owing to the great shrinking of the thickened capsule, a diseased condition is developed completely analogous in other respects to that of cirrhosis." Although regarding perihepatitis as ordinarily secondary to disease of the liver-substance, he remarks that it not infrequently extends from the right pleura and diaphragm, or from an adjacent portion of intestine. Occlusion of the excretory bile ducts may, in his view, give rise to shrinking of the liver; but, if such occlusion be primary, it is not accompanied by ascites. As a secondary condition, however, this stenosis of the bile ducts is ascribed by von Schüppel to perihepatitis and general peritonitis.

As regards the character of the effused fluid, Schröder observes that the exudation in chronic peritonitis resembles the fluid of ovarian cysts, containing fibrinous coagula, paralbumen, and serum albumen. In few instances does ascitic liquid contain more than five per cent. of albumen, being especially poor in this element in amyloid disease. When resulting from hepatic cirrhosis, it often contains enough bile-pigment to give it a decided olive hue; while in tuberculosis or carcinosis a considerable admixture of blood is frequently present.

The first question of interest in the above-described case concerns its etiology. The indications, intra vitam and post mortem, were that the initial pleuritis occurred on the left side, whence a direct extension to the hepatic capsule is hardly probable; yet the history of this attack points so strongly to diaphragmatic involvement that the connection seems more than a mere coincidence. If so, the disease may have extended by continuity across the serous investment of the diaphragm to a perihepatitis, or have spread from an intermediate perisplenitis. The cirrhosis and the biliary obstruction were evidently secondary; and, in view of the extent of the latter, it seems strange that there should have been no icterus.

Another marked circumstance is the quantity of fluid effused and the amount of contained albumen. Exclusive of the first tapping, nearly twenty-five gallons were removed within sixteen months, thus controverting the opinions of most pathologists.*

Although the necropsy showed exudates of various dates, no rise of temperature or other evidences of acute exacerbations followed the aspirations, the patient, until the latter part of his illness, being up and about, despite all remonstrances, the next day. Incidentally may be mentioned here an advantage of aspiration over the ordinary method of paracentesis with a large trocar, in that the more gradual withdrawal of the fluid obviates the tendency to syncope or even discomfort.

The access of sciatica and the subsequent attack of temporary paraplegia point to the date of extensive pelvic exudation, causing first neuralgia, then paralysis which subsided with contraction of the exudate. The pressure on the pelvic venous trunks accounts for the rapid increase of œdema. At the time, however, I was led to fear that the disease had become malignant. I am at a loss to explain the origin of the pseudo-membrane passed per rectum a fortnight before the patient's death. Thierfelder, treating of cirrhosis, speaks somewhat vaguely of a "consecutive diphtheria of the rectum and colon"; but I can find nothing in the microscopic character of the ejected substance to bring it under this category. We know that intense enteritis sometimes leads to plastic exudation; but there were no signs in this instance of any such active process.

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* Dr. Mahomed ("Brit. Med. Jour.," June 9, 1877), professing to represent the teaching of Dr. Wilks, also asserts that a peritonitis producing serous effusion must be either tubercular or cancerous. Simple chronic peritonitis, causing non-purulent, serous ascites, he classes with the so-called "serous apoplexy," as "a disease which has no existence in the dead-house."

More recently* attention has been recalled to an independent chronic membranous enteritis, of which scant mention is made in medical literature, and of which the pathology is unexplained, characterized by the occasional discharge of membranous shreds or tubes. Whether the present phenomenon should come under this head, I am unable to say.

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Editorials.

AN APOLOGY.

We must apologize to several contributors for having postponed the publication of articles that we had intended to insert in this number of the journal. This postponement has seemed necessary in order to make room for the unusual amount of society proceedings that will be found in the number. The proceedings of the section in obstetrics and gynæcology of the American Medical Association could not well be given earlier, because the absence of many of the speakers from the country during the summer months prevented our securing their revision of the report. It is not to contributors alone that an apology is due, but also to the authors of many books which we are compelled to put off noticing.

Our readers are asked to correct an error which crept into the editorial article in the November number of the journal. Three times in that article the word "track" appears where *tract* was written (p. 491, nineteenth line; p. 493, sixteenth and thirty-second lines). Not only was *tract* written, but it appeared in the proofs; the alteration was made after the editor's final revision of them.

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* Dr. F. W. Goss, "Boston Med. and Surg. Jour.," June 2, 1881.

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Reviews and Literary Notes.

Therapeutic and Operative Measures for Chronic Catarrhal Inflammation of the Nose, Throat, and Ears. Forty illustrations. Part II. By THOMAS F. RUMBOLD, M. D. St. Louis: George O. Rumbold & Co., 1881. Pp. xvi–169 to 467, inclusive.

THIS volume is a sequel to Part I of the same work, already noticed in this journal. Like its predecessor, it is not calculated to add much to what has already been published in other works upon the same subject. The author modestly says in his preface: "Having gone entirely out of the beaten track with respect to the method of making local applications, I may have been too regardless of long-established practices. This, however, I leave to the general profession, who, after all, are the true critics. Their almost universal dissatisfaction with the prevailing methods will soon lead them to ascertain for themselves whether what I have recommended is an improvement, or merely a change."

All the instruments illustrated are of the author's own invention. Upon reading the book, however, we are not surprised to find that the methods advocated are, almost without exception, such as are already in general use. For example, local applications to the throat by means of the atomizer, etc. The instruments figured are, with few exceptions, inferior to those commonly employed for corresponding purposes. One, however, a retractor for the uvula, is worthy of attention. "It is a tube, six inches long and one eighth of an inch in diameter, having at one end an enlargement three sixteenths of an inch transversely and cup-shaped, for the reception of the uvula; the other extremity is trumpet-shaped, one inch in diameter, and is covered by a single thin sheet of India-rubber. To use it, expel the air from the tube by making gentle pressure upon the India-rubber, apply the smaller extremity to the uvula, and then relax the pressure upon the India-rubber, when the uvula will be drawn into the smaller end of the tube about one quarter of an inch. The uvula may then be drawn gently forward, or to one side."

With regard to the pathology of nasal catarrh, the author's views are certainly peculiar. In general, he believes that all of the conditions which may be associated with nasal catarrh are its direct results; e. g., "When we consider the number of nerves that pass through the pharyngo-nasal and nasal cavities, the variety of their functions, the organs to which they are distributed, and the effect of a long-continued inflammation on their peripheral extremities, it might very properly be expected that the organs to which the nerves are distributed would be ultimately diseased. This is plainly shown by symptoms that patients usually call neuralgia of the head. From the inflammation of the pharyngo-nasal cavity in the neighborhood of the basilar process, some will have a pain so severe on top of the head that it will cause an abscess. A young lady, sent to me, had an abscess of this description on the top of her head that discharged nearly a tablespoonful of pus on its being opened. The only cause for it was the excessive pain in that locality, and that it was occasioned by the inflammation in the pharyngo-nasal cavity was proved by the immediate relief following a soothing application made to the inflamed surface of the nasal passages." Again: "Instead of showing its effects on various portions of the respiratory tract, the disease may manifest itself by producing a palpitation of the heart." And, again: "I believe that this same chronic inflammation of the nasal passages may affect the blood-vessels of the membrane on the base of the brain itself to such an extent as to produce an altered condition of its functions, and thus really produce insanity." To explore the work further seems unnecessary.

Anatomical Studies upon Brains of Criminals. A Contribution to Anthropology, Medicine, Jurisprudence, and Psychology. By Moriz Benedikt, Professor at Vienna. Translated . . . by E. P. Fowler, M. D., . . . Department of Translation, New York Medico-Chirurgical Society. New York: Wm. Wood & Co., 1881. Pp. 185.

The author considers the two principal typical mental characteristics of criminals to be an inability to restrain themselves from the repetition of a crime, notwithstanding a full appreciation of the superior power of the law, or of society; and a lack of the sentiment of wrong, though with a clear perception of it. He has made a minute analysis of the external configuration of the cerebral hemispheres, and their relations to other parts, and a series of very careful and minute observations upon the brains of twenty-two criminals from the Royal Croatian Prison, which are reproduced in this translation, by the photo-engraving process, from the original photographs.

The characteristics shown to exist in these brains are deficient gyrus development, and a consequent excess of fissures, throughout the entire extent of the brain. The fissures tend to communicate, so that, if they were water-courses, a body floating in any one of them could enter almost all the others. This was formerly regarded as a sign of high development, but, the author says, erroneously so. In ascending the scale of animal life the appearance of fissures is attended with an increased development in neighboring regions, but the extension of fissures in the human brain implies the deficiency of the connecting portions (annectants) between the gyri.

It is probable that this very elaborate and conscientious investigation will acquire an increased value in the future, when reinforced by more extended observations. Meanwhile it is very interesting and suggestive. In the words of the translator, who has faithfully and well performed his part, such investigations lead directly toward "a more rational, humane, and, at the same time, a more radical and secure disposition of overt criminals."

American Nervousness, its Causes and Consequences: a Supplement to Nervous Exhaustion (Neurasthenia). By GEORGE M. BEARD, A. M., M. D., etc. New York: G. P. Putnam's Sons, 1881. Pp. xxii–352.

As the title indicates, this is intended as a chapter on the remote causes of mal-nutrition of the nervous system, or, as the author chooses to call it, neurasthenia, the chief of which causes, in his opinion, is modern civilization, characterized by steam-power, the periodical press, the telegraph, the sciences, and the mental activity of women. *American* nervousness is ascribed to dry air, extreme heat and cold, civil and religious liberty, and the great mental activity in a new country. It is a readable book, even to those to whom it seems that the author's philosophy sometimes borders on fantasy.

Diagrams of the Nerves of the Human Body, exhibiting their Origin, Divisions, and Connections, with their Distributions to the Various Regions of the Cutaneous Surface and to all the Muscles. By WILLIAM HENRY FLOWER, F. R. S. Third edition. Philadelphia: Presley Blakiston, 1881. 4to, pp. 11. [Price, $3·50.]

THIS edition of Flower's well-known diagrams is an attractive volume, and in every way worthy of the general favor with which the work has met.

Mr. Spencer Wells's Note-Book for Cases of Ovarian and Other Abdominal Tumors. Sixth edition. London: J. & A. Churchill, 1881. Pp. 25.

A SIXTH edition of a little work by an author whose name is so indissolubly connected with ovariotomy needs no more in the way of commendation than a mere mention of its title.

An Index of Comparative Therapeutics, with Tables of Differential Diagnosis, a Pronouncing Dose-List in the Genitive Case, a List of Medicines used in Homœopathic Practice, etc. By SAMUEL O. L. POTTER, M. D., President of the Milwaukee Academy of Medicine, etc. Chicago: Duncan Brothers, 1880. Pp. vi–280.

THIS little book gives a very fair idea of the peculiarities of the practice of our homœopathic brethren, so far as we are able to judge, and attempts to show the differences between that practice and ours in the matter of the treatment of individual morbid manifestations. It is a modest, unpretending production, refreshingly free from cant.

BOOKS AND PAMPHLETS RECEIVED.—The Science and Art of Midwifery. By William Thompson Lusk, A. M., M. D., Professor of Obstetrics and the Diseases of Women and Children in the Bellevue Hospital Medical College, etc. With numerous illustrations. New York: D. Appleton & Co., 1882. Pp. xviii–687.

===== Gerichtsärztliche Praxis. Vierzig gerichtsärztliche Gutachten erstattet von Dr. Hermann Friedberg, Professor der Staatsarzneikunde an der Universität und Kreisphysikus in Breslau. Mit einem Anhange über die Verletzung der Kopfschlagader bei Erhängten und Erdrosselten und über ein neues Zeichen des Erwürgungsversuches. Wien und Leipzig: Urban & Schwarzenberg, 1881. Pp. xii–452. ===== Eczema and its Management. A Practical Treatise based on the study of two thousand five hundred cases of the disease. By L. Duncan Bulkley, A. M., M. D., Attending Physician for Skin and Venereal Diseases at the New York Hospital, Out-Patient Department, etc. New York: G. P. Putnam's Sons, 1881. Pp. x–344. [Price, $3.] ===== Photographic Illustrations of Cutaneous Syphilis. By George Henry Fox, A. M., M. D., Clinical Lecturer on Diseases of the Skin, College of Physicians and Surgeons, New York, etc. Parts 10, 11, and 12. New York: E. B. Treat. ===== Historical Sketch of the Obstetrical Society of Boston. By Benjamin E. Cotting, A. M., M. D. (Harv.).—Biographical Sketches of Deceased Members, etc. By William W. Wellington, A. M., M. D. (Harv.). Boston: David Clapp & Son, 1881. Pp. 73. ===== Favorite Prescriptions of Distinguished Practitioners, with Notes on Treatment. By B. W. Palmer, A. M., M. D. New York: Bermingham & Co., 1881. Pp. 121. ===== The Anatomist; being a Complete Description of the Anatomy of the Human Body, intended for the use of students preparing for examination at the Royal Colleges of Surgeons and other medical bodies. Second edition, improved and enlarged by the addition of 171 wood engravings. By M. W. Hilles, formerly Lecturer on Anatomy and Physiology at the Westminster Hospital School of Medicine, etc. New York: G. P. Putnam's Sons, 1881. Pp. xix–360. [Price, $1·75.] ===== A Treatise on Food and Dietetics, Physiologically and Therapeutically considered. By F. W. Pavy, M. D., F. R. S., F. R. C. P., Physician to, and Lecturer on Physiology at, Guy's Hospital. Second edition. New York: William Wood & Co., 1881. Pp. xii–402. [Wood's Library of Standard Medical Authors.] ===== A Text-Book of Physiology. By M. Foster, M. A., M. D., F. R. S., Prælector in Physiology and Fellow of Trinity College, Cambridge. Second American, from the third and revised English edition. With extensive notes and additions by Edward T. Reichert, M. D., Demonstrator of Experimental Therapeutics, University of Pennsylvania. With 259 illustrations. Philadelphia: Henry C. Lea's Son & Co., 1881. Pp. xxiii–13 to 987, inclusive. ===== Essentials of the Principles and Practice of Medicine. A Hand-Book for Students and Practitioners. By Henry Hartshorne, A. M., M. D., lately Professor of Hygiene in the University of Pennsylvania, etc. Fifth edition, thoroughly revised and improved. With 144 illustrations. Philadelphia: Henry C. Lea's Son & Co., 1881. Pp. 669. ===== The Therapeutics of Gynæcology and Obstetrics, comprising the Medical, Dietetic, and Hygienic Treatment of Diseases of Women. Second edition, thoroughly revised and greatly enlarged. Edited by William B. Atkinson, A. M., M. D., Author of "Hints in the Obstetric Procedure," etc. Philadelphia: D. G. Brinton, 1881. Pp. 571. ===== A Practical Manual of the Treatment of Diseases of the Rectum. By Henry Smith, F. R. C. S., Surgeon to King's College Hospital, etc. First American, from the fourth English edition, with numerous additions and illustrations. New York: Bermingham & Co. Pp. 44. [Library of Medical Classics, No. 1, Price, 25c.] ===== Clinical Lectures on the Diseases of Women, delivered in Saint Bartholomew's Hospital, by J. Matthews Duncan, M. D., etc. New York: Bermingham & Co. Pp. 67. [Library of Medical Classics, No. 2, Price, 35c.] ===== A Manual of

Venereal Diseases, for Students and Practitioners. Being a concise description of those affections and of their treatment. By Berkeley Hill, Professor of Clinical Surgery in University College, London, etc., and by Arthur Cooper, late House-Surgeon to the Lock Hospital. Second edition. New York: Bermingham & Co. Pp. 25. [Library of Medical Classics, No. 3, Price, 20c.] ═══ A Practical Treatise on Hernia. By Joseph H. Warren, M. D., Member American Medical Association, etc. Second and revised edition, fully illustrated. Boston: James R. Osgood & Co., 1882. Pp. xvii–4 to 428, inclusive. ═══ Contributo alla Patologia del Fegato. Studio clinico-anatomico sulla Cirrosi Ipertrofica del Fegato con Sintomi d'Ittero Grave. Pel Dott. G. B. Ughetti, Coadiutore alla Clinica Medica di Catania, etc. [Reprint.] ═══ Note Cliniche ed Anatomiche sulla Lepra. Per Campana Roberto, Professore nella Regia Università di Genova. Con due tavole. Milano: Fratelli Rechiedei, 1881. [Reprint.] ═══ Transactions of the Medical Association of the State of Missouri, 1881. ═══ Quarterly Report of Medical Officers, United States Army, etc., October 1, 1881. ═══ The Medical Record Visiting List, or Physicians' Diary, for 1882. New York: William Wood & Co. ═══ The Physicians' Hand-Book for 1882. By William Elmer, M. D., and Albert D. Elmer, M. D. New York: W. A. Townsend, 1882. ═══ In addition we have received a number of pamphlets, the separate acknowledgment of which is prevented by lack of space.

Proceedings of Societies.

AMERICAN MEDICAL ASSOCIATION.

SECTION IN OBSTETRICS AND GYNÆCOLOGY.

The thirty-second annual meeting of the association was held in Richmond, Virginia, May 3, 4, 5, and 6, 1881, Dr. James R. Chadwick, of Boston, Chairman of the section.

First Day, Tuesday, May 3d.

The Use of Pessaries.—Dr. Paul F. Mundé, of New York, spoke concerning pessaries, vaginal and vagino-abdominal, and gave the following rules with reference to their introduction and supervision: 1. Always be sure of the diagnosis of the nature and degree of the displacement before resorting to a pessary. 2. Always replace the uterus before applying a pessary. This applies particularly to backward displacements. It is well to replace the uterus repeatedly, every day or twice daily, for several days before introducing a pessary. The replaced organ may be supported by cotton tampons in the interval, if it is desired to distend and toughen the vaginal pouch; or the object of relaxing the abnormally stretched uterine ligaments may have been obtained by the mere repeated replacement. In flexions, chiefly anteflexions, the frequent straightening of the uterus, or conversion into the opposite flexion, with the sound will often prove beneficial before introducing a pessary. 3. Never insert a pessary when there is evidence, by the touch, of acute or recent inflammation of the uterus or its adnexa, or when pressure with the finger on the parametrium (where the pessary is to rest) gives decided pain. 4. When the uterus is not replaceable —that is, when adhesions bind the fundus down—use great caution and discrimination in deciding whether an attempt should be made to elevate the fundus by manual or instrumental means, or whether the elevation should first be tried by the gradual action of a pessary. (This applies only to retro- and lateroversions.) If neither is to be recommended, do not introduce a pessary until local alterative and absorbent measures have effected resolution of the adhesions. 5. Always choose an indestructible instrument, if possible. This does not apply to prolapsus uteri. 6. Always measure and estimate the vagina carefully before choosing a pessary, and be careful to adjust the pessary in every particular (size, curve, and width) to the particular case. No two vaginæ are exactly alike. 7. If the vaginal pouch is not sufficiently deep to accommodate a pessary (anterior pouch for forward displacements, posterior pouch for backward displacements), defer the attempt to fit a pessary until the pouch has been deepened by daily tamponing with cotton, or by the upward pressure of a Cutter or Thomas vagino-abdominal supporter. Or the pouch may be gradually deepened by using first a small instrument (slightly curved in backward displacements), and gradually increasing its size (or curve) until the desired size and shape for permanency are reached. 8. Never leave a pessary in the vagina which puts the vaginal walls to the stretch, and which does not permit the passage of a finger between it and the wall of the vagina. This does not apply to prolapsus uteri. 9. A vaginal pessary which projects from the vulva is displaced. 10. A pessary which gives pain must at once be replaced by one which is painless. 11. A well-fitting, properly-chosen pessary should not only give no pain, but should be a direct source of comfort to the patient. 12. Always examine a patient on her feet after introducing a pessary, or, when it is desired, at her return, to ascertain its efficiency in sustaining the uterus during walking and exertion. 13. Always tell the patient that she has a pessary in her vagina, or she may not return in spite of your directions, and the pessary may remain for years, to her ultimate great discomfort and danger. 14. Always tell the patient to return within a week after the first introduction, in order that the position and working of the pessary may be looked after, and that, if it does not suit, it may be removed and a better one inserted. Tell her that several trials and various instruments may be required before one is found that she can wear permanently. Also let her return for inspection once every four or eight weeks, as the case may require. Tell her that if she fails to do so the pessary may cause ulceration which will require treatment. 15. Tell the patient that she will need to wear a pessary for months, perhaps years, before a recovery can be expected. 16. Never introduce a pessary which the patient can not remove herself. 17. Tell the patient to remove the pessary herself if it gives pain, and show her how to do it. When she has removed it, let her present herself at once for examination. 18. Tell the patient to use vaginal injections daily for cleansing purposes. If she notices profuse discharge, add astringents; if the discharge is sanious or purulent, let her come at once, as the pessary has probably caused abrasion. 19. Tell her, on removing a pessary to test the result, that the permanence of the benefit obtained therefrom can not be determined for several days or weeks. 20. Always direct your patients to relieve all superincumbent pressure on the pessary by a proper support of their skirts; and, if the displacement be anterior, aid the internal supporter by an abdominal (supra-pubic) pad. All pessaries may be introduced in the knee-chest posture when it is desirable or possible to replace the uterus only in that posture. ═══ Dr. R. Beverley Cole, of San Francisco, then made remarks with reference to the mechanical treatment of displacements and some of the diseases of the uterus, in the course of which he spoke of Hodge's pessary as the first instrument which illustrated any proper knowledge of the anatomy of the female pelvic organs. He exhibited an instrument which possessed what he regarded as an important modification, consisting of a spring support for retroversion. For this the special advantage was claimed that there was no risk of producing inflammation, as in the use of other instruments, by placing the uterus upon an unyielding surface. Dr. Cole had found the spring modification very valuable in the treatment of anteversion, and, while it seemed that Dr. Mundé had used Dr. Thomas's cup-pessary in that class of cases with much success, it had not in his hands at all aided in accomplishing the desired end. In addition, Dr. Cole exhibited an intra-uterine galvanic stem pessary. It had the two metals arranged as plates extending longitudinally, which were insulated by an interposed layer of hard rubber, so that the current was distributed the entire length of the stem. In that respect it differed from Sir James Y. Simpson's instrument, in which the current was limited to the point of union between the two metals at the center of the staff. He had used his pessary in cases of what he called superinvolution of the uterus with very marked success—so much so as to restore the menstrual function which had been absent for five years, and pregnancy had followed. In another peculiar condition, in which the uterus was soft and flabby, settled down upon the posterior vaginal wall, and when an attempt was made to introduce the probe it was found that there was a double curve of the organ, the first forward and the second backward, a condition which he had not seen described, and which he called atony, he had found his galvanic stem pessary to be very serviceable. Dr. Cole also exhibited a gas cautery which he had invented. He preferred the red to the white heat for cauterizing the cervical mucous membrane, because it was not so liable to be followed by hæmorrhage. In conclusion, he had made a pessary according to Simpson's method, which consisted first of allowing a piece of the best sheet gutta-percha, five or six inches by one and a half or two inches, to remain in hot water until it had risen to the surface, when it would be sufficiently softened to manipulate. It was then removed from the water and rolled between the hands, keeping the hands constantly wet, until a roll, somewhat thicker in the center than at the extremities, and of the desired size, was produced, when it was doubled upon itself and the ends united by pressure. The ring thus formed was molded into the shape desired, and then dropped into cold water, where it soon became inflexible. It was Simpson's method of making pessaries, and the advantage it possessed was that it enabled the practitioner to take cognizance of peculiarities and adapt instruments to individual cases. The difficulty with the tin ring was that in introducing it, although its shape might be perfect, the operator was very liable to change its form; and the same thing might occur in its removal. So the gynæcologist was in doubt whether the shape given the instrument remained unchanged by either introduction or removal. ═══ The general discussion on the subject of pessaries which followed was opened by Dr. Albert H. Smith, of Philadelphia, who accepted Dr. Cole's statement that the subject was one of great importance, and also that it was important to know when to use a pessary and when not to use one. He thought that pessaries were largely used when they should not be; they should not be employed indiscriminately. Although it was easy to insert a pessary, it was difficult to select a proper instrument. Pessaries could not but do harm in cases in which the uterus did not have its proper mobility on account of old adhesions. He believed that pessaries were used too much as a temporizing agent. The uterus could be elevated and temporary relief afforded in very many cases; and that was too frequently done, and the fact ignored that attention should be given first to the cure of inflammatory or other conditions which caused the uterine displacement. When the inflammatory condition which gave rise to the displacement was properly treated, the uterus, in very many cases, would be restored to its normal position without resorting to any mechanical support. He readily indorsed the statement that the pessary bearing his name failed to meet the indication in a large number of cases; for it was applicable simply in cases of retroversion and prolapsus. But he also failed to indorse the claim made by both Dr. Mundé and Dr. Cole concerning the efficiency and utility of anteversion pessaries, for he had found them all failures. He thought that anteversion was not essentially a pathological condition. It was also impossible to keep the uterus in an absolutely upright position with reference to the bony wall in front; for any pessary which pressed sufficiently upon the anterior wall of the uterus to do that would produce more pressure upon the bladder, and give rise to more tenesmus, than the anteversion itself. Anteversion was often found with anteflexion, which was a disease of itself, not, he considered, pathological merely from the fact of its having a displacement associated with it, but from the alteration which it produced in the canal of the uterus, and from the conditions with which it was associated. With anteflexion occurred dysmenorrhœa, uterine congestion, and other difficulties, independent of the fact that the fundus of the uterus pressed forward. In such cases the anteflexion must be cured before a pessary was used; and when that was cured the patient was cured. He effected this in very many instances with a stem pessary, and the instrument which he employed was the small, slender stem, such as Dr. Chadwick used in connection with his ring. With this he had had the same results as had been claimed for the galvanic pessary, which, as he believed, acted simply mechanically. In any case in which the uterus had its natural mobility, in which the sound could be introduced easily and properly, an intra-uterine stem pessary could be used to correct the anteflexion, and in that way the anteversion, to a great extent, would be corrected, and the symptoms relieved for which the anteversion pessary was proposed. He believed that, as a rule, anteversion pessaries were unnecessary. With regard to the distorted uterus described by Dr. Cole, he had seen it remedied promptly by the use of a stem pessary, which straightened the uterine canal and at the same time stimulated the body and neck of the organ into healthy action. These were the cases in which the finger could be carried around the uterine body, which was so soft that it could scarcely be recognized through the abdominal walls by bimanual touch. Dr. Smith had not seen the superinvolution of the uterus mentioned by Dr. Cole, and therefore had not had any experience in the treatment of such cases. ═══ Dr. H. P. C. Wilson, of Baltimore, said that he did not know of anything which had done more harm and more good than pessaries; and, while he should hardly know how to practice gynæcology without them, yet he had seen cases in which they had done much damage. One point which Dr. Mundé had made he thought should be dwelt upon, and that was the importance of determining, before using a pessary, whether or not the uterus could be elevated; for much injury had been done by introducing an instrument designed to raise the uterus where the condition of the organ and of the surrounding tissues was such as prevented its being elevated at all. Again, he had seen very few cases of anteversion which had been benefited by the use of pessaries, and upon that point he agreed with Dr. Smith and differed from Dr. Mundé. In the case of anteflexion, he had not seen any instance in which the patients had been cured or benefited with pessaries; but in all displacements he might use a great many before he would be able to determine which instrument was best adapted to each case. Indeed, he had cured one case of anteversion with a Hodge horse-shoe pessary when all other instruments had failed. He accepted Dr. Smith's views on another point, namely, that it was doubtful if raising the fundus of the uterus would benefit or remedy anteflexion, for the flexion was, in many cases, permanent—so much so that if the fundus was raised from the bladder the cervix at the same time would be thrown forward upon it. He had not used stem pessaries for many years. His experience in their use had been unfavorable. His judgment and inclination were entirely against their use. In old cases of anteflexion, where there was atrophy at the seat of the flexure, he resorted to division of the cervix backward to the vaginal junction and division of the internal os backward and forward, with greater benefit than he had seen follow the use of any other means. ═══ Dr. G. M. B. Maughs, of St. Louis, inclined strongly to the opinion that he who understood an ordinary vagina would be familiar with the vagina in all human females. The efficiency of all lever pessaries depended upon the integrity of the perineal body. A large bend in the pessary was necessary, if the perinæum had lost its tonicity, to raise the uterus. He took issue with Dr. Mundé's statement that in anteversion the object was to hold the fundus uteri up until the ligaments had regained their tonicity. The difficulty was to hold the fundus up sufficiently long to permit the ligaments to be stretched. The opposite was the case in retroversions, for there the ligaments were relaxed, and the weight of the uterus must be removed in order to give them the opportunity to be restored to their natural condition. In anteversion it frequently occurred that a pessary could not be used at all, and in all those cases we wished to hold the fundus up until the ligaments *lost* their tonicity. His method of treatment was to put in a cotton plug, which prevented the neck from falling back into the posterior vaginal cul-de-sac, and another in front, to prevent the fundus from falling forward; and in that way he frequently succeeded in overcoming a displacement which could not be treated with a pessary. In retroversion, Dr. Mundé had wisely directed attention to the propriety of replacing the uterus repeatedly before attempting to use a pessary, and then adjusting the latter to the vagina. In many cases of anteversion, as Dr. Wilson had said, the best treatment which could be adopted was section of the cervix according to Sims's method. In the virgin, anterior displacement was the rule, and in the multipara retroversion. The normal shape of the uterus was that of anterior curvature. He employed the intra-uterine stem pessary, but never without great fear. ═══ Dr. Mundé said that he had given a certain number of precautions and principles to be observed in the use of pessaries, and believed that if they were carefully observed but comparatively little damage could be done by employing such instruments. He also believed, contrary to Dr. Smith's view, that when the fundus uteri was far forward and certain symptoms were present, and those symptoms were relieved completely and immediately as soon as the fundus was lifted up, and returned as soon as the fundus was again allowed to fall forward, it was the anteversion that produced the symptoms. He admitted that Dr. Maughs's criticism was correct. He did not remember to have seen a case of anteflexion cured by the use of pessaries; but he had found that by using the cup pessary exhibited, changing it frequently and making the cup a little higher each time, he could in the course of a few months nearly straighten the uterus, and that it would remain straight so long, and only so long, as the instrument was worn. The only instrument which would thoroughly correct anteflexion was the stem pessary, but he had not been able to make his patients wear it. ═══ Dr. Cole said that he had not recommended the stem pessary for any cases except those belonging to one of two classes: 1. Atony of the organ, where there was neither inflammatory action nor irritation; and then the instrument was used to cause irritation. 2. Superinvolution; and he congratulated Dr. Smith that he had never met with such cases. The galvanic pessary in those cases had been more successful, in his hands, than any and all other means at his command. He would not introduce a stem pessary into a uterus that was simply anteverted or anteflexed, but in that respect Dr. Smith's experience was different from his. The stem pessary in such cases had acted very badly in his hands.

(*To be continued.*)

AMERICAN GYNÆCOLOGICAL SOCIETY.

The sixth annual session was held in New York, September 21, 22, and 23, 1881, Dr. Thaddeus A. Reamy, of Cincinnati, First Vice-President, in the chair.

Address of Welcome by the President of the New York Academy of Medicine,* Dr. Fordyce Barker.—Fellows of the American Gynæcological Society: Five years ago an inaugural meeting was held in this hall for the purpose of organizing this society. In the language of our secretary, "It was a nucleus round which the gynæcologists of the country could cluster." It was a surprise to me to see such a number of representative men come together from other and distant cities, at such cost and sacrifice of time, in their zeal and interest in that department of science and art to which they had devoted their lives. The society was organized by the adoption of a constitution and by-laws, and election of officers. Three months after its organization the first meeting for scientific work, a session of three days, was also held in the hall of this academy. Since then the society has had annual sessions of three days in Boston, Philadelphia, Baltimore, and Cincinnati. The profession in this and the other cities have stimulated and encouraged the society in its work by a large attendance and by a genial hospitality. The guests invited by vote of the society have added to the interest and importance of its discussions. The fruits of our labors are seen in the five volumes on the table before us. It would not be becoming in one of its associates to boast of the value and importance of the contributions of the society to this department of our profession, but I do think that I am justified in saying that we have great reason to be cheered and inspirited by the past to continue in well-doing by zealous, honest, able work, so that all who aim for high reputation in obstetrics and gynæcology will seek to obtain membership, as giving the seal and stamp of eminence. At the recent wonderful gathering of the profession in London it was most gratifying to note how generally, how frankly, and how cordially the preëminence of American gynæcologists was conceded by the most distinguished men from all the European nationalities represented at the International Congress, notwithstanding the difference of opinion in regard to many special subjects. I can not forbear an allusion to one great feature of the work which has been accomplished through the instrumentality of this society, with the coöperation of one of our honorary fellows, Dr. John S. Billings, U. S. Army, in charge of the national medical library in Washington. In the last four volumes of the transactions of the society appears a complete index of gynæcological and obstetrical literature from July, 1876, to January, 1880. Every fellow of this society, every purchaser of these volumes, can now know where to find without trouble all the literature pertaining to any subject in connection with obstetrics and gynæcology. I think no one will consider that I go too far in saying that every writer on these subjects, and, indeed, that every conscientious practitioner who wishes to do justice to those who commit themselves with confidence to his professional charge for treatment of affections which belong to this part of our profession, has no excuse for ignorance of what is now the common stock of its literature. I esteem it as a high honor, as well as a great pleasure, now, in behalf of the New York Academy of Medicine, to welcome the American Gynæcological Society, at its sixth annual meeting, to its hall, and in expressing the hope that its three days' session may be memorable in the future, not only as a refreshing season, but as an era in its history from its contributions and additions to our science and its art. As our society bears a national name, I may be pardoned for an allusion to one striking contrast as regards the associations which surround us, and must in a degree affect us all at the present time, as compared with those at our first gathering in this hall. Then the country was celebrating the first centennial of its existence as a nation; now the whole country—North, South, East, and West equally—is clouded by a national sorrow which annihilates the bitterness of party feeling and unites all in a common bond of sympathy and mourning. On two occasions before the country had felt the shock which must follow the death of its President from disease. Another fell by the hand of an insane fanatic at the close of a fearful struggle between different sections of the country, and his death is lamented as a great public calamity by both parties in the contest which had just terminated. But no one ever could have anticipated the possibility that one chosen by the suffrages of a free and reunited people, bound together more closely by ties of common interest and sympathy than ever before, could be in danger to his life from an assassin. If the presence of such an event casts a deep shadow of sadness over our festive reunions, it should not diminish our zeal for work in the noble aims to which our meetings are devoted.

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* The session was held in the hall of the Academy of Medicine.

ACUTE HYPERÆSTHESIA OF THE PERITONÆUM, EITHER CIRCUMSCRIBED OR DIFFUSED, FOLLOWING MINOR GYNÆCOLOGICAL OPERATIONS AND MANIPULATIONS. —Dr. SAMUEL C. BUSEY, of Washington, reported the following case, as representing a type of cases occasionally occurring, of which the predominant clinical feature was pain and tenderness diffused over the entire area of the abdomen, unaccompanied with the other usual symptoms of inflammation: Mrs. —— had suffered, at varying intervals, for a series of years with dysmenorrhœa, due mainly to anteflexion of the womb. At several preceding menstrual periods her suffering had been intense, and seemed to increase at each succeeding menstruation.

A week previous to the expected period in January, 1881, a very small laminaria tent had been introduced, and permitted to remain until expansion was complete. The following period was painless. The February period was passed without the preparatory dilatation, and her suffering was quite as intense as at any time before. On Thursday, March 9th, one week previous to the expected menstruation, the author introduced without difficulty a laminaria tent of about the size of an ordinary metallic knitting-needle. Soon after he left the house the pain began and rapidly increased in intensity, reaching in about forty minutes (when the tent was withdrawn by the husband) a degree of agony never before experienced. The pain began in the womb, and was speedily diffused over the entire abdomen. The sensitiveness was so acute that the weight of the bed-clothes could not be borne. Every jar of the bedstead, or of the floor of the apartment, increased her suffering. Coldness of the extremities, pallor of the face, nausea and vomiting, and vesical irritability took place apparently at the same time with the hyperæsthetic phenomena. A twenty-drop dose of chlorodyne was given, and a messenger was dispatched for Dr. Busey. He did not reach her bedside, however, until three hours later, and in the mean time a second dose of the anodyne had been administered. He found her pale, with an expression indicating suffering. Her pulse was feeble, small, and irregular; the tongue was slightly coated; there was some nausea; the abdomen was retracted. The pain, though greatly diminished, was felt over the entire abdomen, most acutely in the hypogastrium. The abdomen, as she lay with the lower limbs straightened out, was so tender that no examination could be made. Tympanites and fever were absent. He ordered hot fomentations to the abdomen, a continuance of the chlorodyne as might be necessary, rest, and a bland diet. The next day she was quite relieved, only a slight feeling of soreness in the hypogastrium remaining. She continued to improve, and on Sunday afternoon the flow began painlessly. This period was freer from suffering than any during the previous six months, excepting the one in January. The author of the paper said that, as previously stated, a similar clinical picture had been several times witnessed, perhaps always following some minor gynæcological operation or manipulation. What was the pathological condition? The absence of fever, tympanites, and effusion excluded inflammation. It was true, latent inflammatory processes took place in serous membranes, and post-mortem appearances not infrequently observed by experienced pathologists were ascribed to inflammation when the clinical history failed to supply the usual and characteristic symptoms. In such cases adhesions, exudation, or thickening of the membrane was found. Dr. Emmet (see "N. Y. Med. Jour." for October, 1880, p. 398) had recently called attention to a septic form of peritonitis without characteristic symptoms, and expressed the opinion that the "more malignant the form of peritonitis, the more certainly would every characteristic sign be absent." Dr. Jacobi had observed "a number of fatal cases of peritonitis, with very little elevation of temperature, almost up to the last minute of life." It was true, also, that inflammatory effusion might take place in the peritoneal cavity and be attended by only such symptoms as might be due to the presence or accumulation of the exudate. The course and type of these modified forms of peritonitis were, however, entirely different from the cases of intensely acute and evanescent suffering, characterized by agonizing pain and exquisite tenderness, either circumscribed or diffused over the entire area of the peritoneal expansion. If inflammation was excluded, would not the freedom from fever, the rapid subsidence of the symptoms, and the absence of consequent conditions, bar the hypothesis of simple inflammatory hyperæmia? Or was it possible that the prompt use of the narcotic and hot fomentations aborted the inflammatory process in its initial stage, before the symptomatic fever was developed? It might be—and he was not prepared either to deny or to affirm it—that local elevation of temperature did occur; if so, it was not complained of by the patient. If present, it, together with other signs, would presumptively establish the condition of inflammatory hyperæmia, and as conclusively prove the value of the abortive treatment. The theory of inflammation was, however, unsatisfactory, and in the case related would prove too much, inasmuch as it would attribute the cure to the efficacy of a moderate and evanescent narcotic, and pretermit the more logical conclusion that the speedy relief was due to the prompt removal of the cause. If the withdrawal of the tent was in fact the remedy, then the assemblage of symptoms was manifestly a neurosis, finding its explanation in the excessive sensibility of the peripheric endings of the sympathetic nerves supplying the part irritated, and in the morbidly heightened excitability of the perceptive nerve-centers, which was so great as to produce reflex gastric, cardiac, and vaso-motor disturbances. The tent was the exciting cause, and the focus of irritation was located along the cervico-uterine canal. Upon this hypothesis all the symptoms might be explained. The relation of cause and effect might be traced as follows: 1. The pallor and coldness were due to irritation of the vaso-motor center, the gastric and cardiac disturbance to irritation of the pneumogastric center, and the diffused pain and tenderness to irritation of the sensory fibers of the sympathetic supplying the peritonæum. It was not improbable, however, that this exaltation of sensibility might have had its cause in the passive distention of the peritoneal capillaries that probably existed, the natural result of the emptiness of the superficial tegumentary capillaries. The condition described exhibited a marked resemblance to that assemblage of nervous perturbations recognized as shock, or, perhaps, the lesser disturbance of the nervous equilibrium known as collapse; but the suddenness and acuteness of the pain, though not absolutely conclusive, ought to preclude such interpretation of the phenomena, unless it could be shown that a transitory first stage was quickly succeeded by reaction, marked by the initial symptom of pain. The clinical picture presented was probably one of unusual intensity; but the gradations of suffering, varying from an aggravated to milder forms, sometimes barely marked enough to attract attention, so constantly threatened our confidence in the harmlessness of minor gynæcological operations and manipulations, and for the time being disturbed the equanimity and self-reliance of the most astute diagnostician, that he held it a duty, at least to himself, to solicit the views of those present. Pain, he remarked, might be excited at any part of the course of a sensory nerve, from center to periphery; the sensation, however, was always referred to the peripheral ending (law of eccentric perception). As regarded sensations of pain, it was worthy of notice that the sufferer was unable to locate it accurately. He succeeded best when the interference causing the pain acted upon a small peripheral area (e. g., the prick of a needle). When, however, the excitation occurred in the trunk of the nerve, or in the center, or in nerves whose endings were inaccessible (as in the viscera), then there was non-localizable pain (e. g., colic). To *severe pain* was furthermore added, that the phenomenon of radiation easily showed itself, by which localization became impossible. The intensity of pain depended, in the first place, upon the excitability of the sensory nerves, and in this respect there existed, upon the one hand, considerable individual fluctuations; upon the other, we found some nerves (e. g., the trigeminus and the splanchnic) distinguished by excessive sensibility over all others. The greater the number of nerve fibers affected, the greater the pain (Landois, "Lehrbuch der Physiologie des Menschen," p. 888). The conduction of painful sensations took place through the posterior roots, and thence throughout the entire gray substance. Inasmuch as conduction of pain took place throughout the entire gray substance, and inasmuch as the excitation of pain extended within the gray substance in direct proportion to the intensity of the painful interference, we found an explanation of the so-called radiation of painful sensations. In violent pains, the pain appeared to radiate from the point of origin over a greater territory; thus, e. g., in violent toothache, originating from a certain tooth, the pain radiated at once over the entire maxillary region, even over the whole half of the head. To the radiations in the territory of the sensory nerves of the sympathetic belonged the painful affection in the lower abdominal and sacral regions called neuralgia hypogastrica, hysteralgia, etc., which was localized in the several plexuses of the sympathetic.

Dr. James D. Trask, of Astoria, New York, said he would express his thanks to Dr. Busey for the term acute diffuse hyperæsthesia of the peritonæum. The term neuralgia would hardly be applicable in this case, or in the one to which he would now call the attention of the meeting. The symptoms described by Dr. Busey were doubtless the result of reflex action. A local irritation or lesion of the uterus, we all knew, might give rise to these diffuse hyperæsthesias, which we referred to the peritonæum or to the walls of the abdomen. He would concede, however, that in many cases the diagnosis was extremely difficult, and in some cases perhaps impossible. Similar hyperæsthesias might result from central causes—causes acting upon the spinal centers and originating in blood poisoning. Some years ago he attended a lady in confinement whose general health was somewhat deteriorated from causes that could not then be definitely ascertained. On the sixteenth day after labor she had symptoms of puerperal peritonitis. He gave opiates, and put a blister upon the abdomen. In a few days the acute symptoms subsided, but after several days there was a renewal of the extreme hyperæsthesia of the abdomen. She could not bear the slightest touch to the abdominal surface, and suffered from the severest pain. He regarded these symptoms as due to a return of the peritonitis, and treated her accordingly. The symptoms subsided, but soon afterward returned. During thirty-one days she had five distinct attacks. By this time it was discovered that there was sewer-gas poison in the house, the origin of which skilled plumbers, carpenters, and masons had till then failed to discover. In the mean time five other members of the family had been stricken down by disease, two with fever resembling typhoid, one with cerebro-spinal meningitis, and two with gastric fever. Dr. Barker was called during the progress of the case, and after mature consideration pronounced it one of neuralgia of the peritonæum, and advised quinine in large doses. It had been given freely from the first. His advice was followed, and the attacks subsided. Here, then, was a case of peritonitis after which, he thought we could readily conceive, the membrane was left in a condition rendering it still sensitive to the influences of sewer-gas poison, acting upon the spinal centers through the blood, causing a return of the symptoms, but not sufficiently to produce inflammation. He thought the term acute diffuse hyperæsthesia of the peritonæum admirably descriptive of this condition.

Dr. John C. Reeve, of Dayton, Ohio, thought these cases were not of so infrequent occurrence as seemed to be the opinion of the author of the paper and of others. He had met with them quite often. He thought the subject had not received sufficient attention in text-books and from teachers. He therefore believed Dr. Busey had done a service to the profession in writing upon this subject and bringing it before us for discussion. The first case of the kind which he had had was a very marked one, and presented very nearly the same symptoms described in Dr. Busey's case. It arose simply from washing out the cervix with a syringe preparatory to making an application, and it seemed to him that the author of the paper could have found striking instances of the sudden occurrence of hyperæsthesia of the abdomen arising from a simpler cause than that he had mentioned, namely, the introduction of a tent. In the case to which he referred, the patient was a young married woman, who had borne one child. Immediately upon throwing in the stream of water to wash out the cervix she was seized with the most violent and intense pain all over the abdomen, which demanded a hypodermic injection of morphine. He did not know at that time, as it was many years ago, the importance of the prompt administration of narcotics, and he did not push it so far as he should have done. The consequence was, the patient had a severe attack of peritonitis following a simple injection of water. He had frequently been called to cases presenting such symptoms, in which the patient herself had taken an injection of water immediately after coition, to prevent conception. In order to prevent the entrance of the fluid into the uterine cavity, and this accident, he always advised patients, before using the syringe, to stop up the terminal opening. He thought the term descriptive of these symptoms had been well chosen; it was more applicable than neuralgia, and at the same time it did not class it among the inflammatory affections. As to the pathology of the condition, the question was, Was it a neurosis, or was it an inflammatory affection? He should say it was a neurosis, but a neurosis in this sense, that it was the first link in the chain of departure from health which led finally to an inflammation. He referred to the doctrines in regard to the treatment of fever in illustration. It was once taught that if the pulse were reduced by veratrum the fever was controlled; next it was the reduction of the bodily temperature by the external application of cold; but before and beyond the pulse and the temperature there was an affection of the sympathetic nervous system, in regard to which we yet knew so little. So in these cases there was an impression on the nervous system, which was the first link in the pathological chain. If this were promptly treated, it would pass away; if not so treated, it would result in inflammation. He believed all the cases which he had seen since the first one had been controlled by anodynes, and it was very important to know the value of this treatment.

Dr. Henry F. Campbell, of Augusta, Georgia, said that, in a paper which he read at the last meeting of the society, he called these cases by the name of "peritoneal tenderness." They were very common after labor. He had known the condition to arise several times after introducing a sponge or laminaria tent, and it was, he believed, the first link in the chain of inflammation. A young woman of very florid complexion and plethoric habit had been married eighteen or twenty months without any hope of conception, because of obstructive dysmenorrhœa. He introduced a sponge tent, and returning, after four hours, he found her, instead of pale and in a condition suggesting shock, as red as a lobster, and suffering from pain everywhere over the abdomen. He removed the tent, and in a few moments the fever and redness subsided, and she was completely relieved, though he had given her only a quarter of a grain of morphine. He himself believed that the condition was essentially a neurosis, but it was the first step toward reflex inflammatory action, and, if in this case the woman had not been relieved, congestion would have followed the excitor irritation, and well-developed peritonitis might have been the final result. Of course, he did not fail for two days afterward to give her fifteen grains of quinine, for he believed every morbid nervous impression was prone to repeat itself, whether there was blood poisoning or not. Intermittence was an inherent quality in the action of the cerebro-spinal system, and no more indicative of malaria than of any other kind of irritation. Peritoneal tenderness after labor had not been of uncommon occurrence in his practice until after he began invariably to give quinine the day after the child was born. This seemed to have aborted it. He had had cases similar to the one referred to by Dr. Reeve, in which the symptoms had been excited evidently by the entrance of water into the womb and Fallopian tubes during vaginal injections, after both premature and mature labor; but such cases were not reflex, like those produced by the sponge tent, but in them the tenderness was the result of the direct contact of the water with the peritoneal surface. According to the principles of excito-secretory action, reflex congestion and reflex inflammation were just as recognizable, and were as apt to follow certain kinds of centric or peripheral irritation as reflex motion was. The peritoneal tenderness excited by impressions made on the neck of the womb was a neurotic condition, which was the harbinger and the dynamic source of the inflammatory action which followed—*ubi irritatio ibi fluxus.*

Dr. Ely Van De Warker, of Syracuse, New York, said he would venture to enter his protest against the use of the term hyperæsthesia of the peritonæum as a technicality. He thought its tendency was to obscure rather than to throw light on what he thought was a common clinical experience among all physicians. When we suggested a new term in medicine, and especially in gynæcology, which was becoming very much burdened with new terms, the term used should define the condition present, and give us a clearly recognized pathological condition. Peritoneal tenderness or pain was of common occurrence after all of those minor operations on the uterus (if the term minor could be applied to anything that related to the uterus), and he, like Dr. Campbell and Dr. Reeve, had always regarded it as the beginning of inflammation. It yielded to the usual treatment with anodynes, and if it were neglected we should probably be surprised afterward to find pelvic adhesions tormenting our patients. He had no doubt that there was in one class of cases a pain which was purely a neurosis, as, for instance, immediately after introducing a sponge tent (not some time afterward), the pulse became thready, and a cold, clammy perspiration broke out, being symptoms of collapse, a condition which was immediately relieved by an anodyne, and that was the last of it.

Dr. George J. Engelmann, of St. Louis, concurred fully in the views of Dr. Van De Warker. He thought a name had been given to a class of symptoms, whether we had acute diffuse hyperæsthesia of the peritonæum or peritoneal tenderness. Both were but symptoms; in some cases it was the one, in some the other, but in either instance it was a symptom of a disease. We should not name an affection by the symptoms present. We should go to the bottom and find the cause of those symptoms—the actual disease. He had collected a series of these cases of more or less severe peritonitis, in which quite a large number were due to injuries. They were most frequently excited by an operation, often a very slight one, such as the introduction of a tent, an injection of water during the presence of latent pelvic inflammation or chronic cellular inflammation; or they occurred after labor, premature or mature, or after larger gynæcological operations. But the term acute diffuse hyperæsthesia of the peritonæum was only descriptive of symptoms; it did not suggest the cause or the pathological lesion. He would like to hear from Dr. Emmet, who had had so great an experience, and had written so much upon this subject—peritonitis following slight operations in patients with latent cellulitis.

Dr. Thomas Addis Emmet, of New York, thought the term proposed might mislead us. We should not lose sight of the close connection that existed between the mucous membrane of the uterine canal and the peritonæum through the sympathetic nervous system, in consequence of which we often observed these reflex disturbances. He thought the condition was certainly one of shock, and that with reaction might come inflammation. His clinical experience had taught him that in cases in which pelvic inflammation had previously existed we were likely to see this shock at first, and afterward peritonitis; and that the shock and the subsequent peritonitis were not always in proportion to the amount of irritation or exciting cause. He presumed that in the case which Dr. Busey had narrated there had been an old pelvic inflammation—basing this presumption on the fact that there was anteflexion of the uterus. After the lapse of a number of years since his attention had been drawn to the subject, he doubted very much whether a flexure of the body of the uterus ever existed without some pelvic inflammation having preceded it. He thought that it was a symptom of pelvic inflammation, although it might remain long after the inflammation had subsided. In these cases a condition existed afterward which might very easily lead to a fresh pelvic inflammation or peritonitis. That the case referred to was not one of true peritonitis or septic poisoning he thought would not admit of question. The more profound the blood poisoning the less likely there was to be severe pain, and as the disease advanced the temperature would often be lowered. Such had been his experience. In some of the worst cases of peritonitis he had ever seen, resulting from blood poisoning, the condition had not been more than suspected, and was only proven after death. He should judge, from the fact that in Dr. Busey's case the sensibility was increased, it was therefore more like that accompanying an hysterical condition than a true inflammation. But the subject covered too much ground to be discussed in a cursory manner.

Dr. Isaac E. Taylor, of New York, said the tendency of the profession was to look for an inflammatory action, as caused by the introduction of the probe into the uterus, excessive walking, etc., in explanation of pelvic pain, and to overlook two other causes—namely, hysteria and neuralgia. Many years ago a physician in Philadelphia sent him a patient who had suffered with symptoms of peritonitis on the left side, which continued for eight or nine years, and yet there was no inflammatory action existing there whatever. He requested her to take a trip to Europe, to which she objected, but finally went. She was requested, while there, to consult Professor Simpson, and Dr. Taylor was ridiculed for having passed his opinion that the trouble was hyperæsthesia, simple neuralgia, or irritability of the uterus. Gooch, especially, many years ago, had described this form of what he called "the irritable uterus." Bassereau also had called the attention of the profession to the subject, and located its starting-point or origin on the left side of the cervix uteri solely. On the death of Dr. Taylor's patient, two years after her return, the autopsy showed the uterus and the ovaries exceedingly atrophied, the uterus measuring one and a half inches. Dr. Busey had described a similar condition. There might likewise be a diffuse hyperæsthesia or neuralgic condition of the entire peritonæum, and also symptoms of peritonitis of an hysterical character. He thought a distinction should be made between local and general causes. Malaria was quite a common general cause in this city, as indicated by the periodicity of the symptoms. It might also affect other parts of the system, as the head or lungs, and even produce a condition simulating or apparently going on to pneumonia. Under proper treatment, with quinine, these symptoms disappeared. It appeared to him that the case related by Dr. Busey belonged to the class of neuroses, although there might have been some slight local irritation consequent on adhesions, etc.; in the cases to which he referred no such cause existed.

Dr. Emil Noeggerath, of New York, said the discussion of the paper had called forth remarks upon three distinct conditions: First, true peritonitis; secondly, true neuralgia of one or the other tract of nerves supplying the peritonæum and its contents; and, thirdly, neuralgic affection of the uterus. He thought two or three of these conditions had been somewhat confounded. He could indorse what had been said regarding peritoneal hyperæsthesia resembling peritonitis, especially the remarks by Dr. Engelmann. He had published a treatise, in 1872, which spoke largely of this matter, and he there mentioned the fact that there was no manipulation of the uterus which would not occasionally lead to that same class of symptoms which had here been designated as peritoneal hyperæsthesia, and he there showed that in a certain class of cases the slightest touch of the uterus would produce inflammation. He had had this vast subject under consideration a long time, and he had been enabled to confirm his views by post-mortem examinations. A young girl was drying clothes in the kitchen; they caught fire, she became frightened, and all of a sudden she was seized with violent pain in the abdomen; and from that time the same condition which had been described here, so-called peritoneal hyperæsthesia, was developed, and she died by eleven o'clock the next morning. Three or four hours afterward he made a post-mortem examination. He could not imagine how a young, healthy, robust woman could die of simple hyperæsthesia of any organ, or of peritonitis of which there were no other symptoms than pain. He found half a teaspoonful of serous exudation in the peritonæum on either side of the uterus, and upon examining it under the microscope found that it was full of cells belonging to the Fallopian tubes. He then examined the Fallopian tubes, and found that there must have existed in them for a long time a subacute catarrh. Now we had an explanation; the fright probably brought about contraction of the muscular fibers of the uterus, as it did occasionally, and coincident with contraction of the uterus muscular contraction of the Fallopian tubes took place, and expelled septic matter into the peritoneal cavity. Now, had he not examined this secretion so carefully he might have mistaken the case for one of simple peritoneal hyperæsthesia, and classed it as such, and as the cause of death. Since that time he had continued to investigate the subject, and had found on record a number of cases in which patients died of peritonitis developed suddenly, and the exudation in the abdomen was not much greater than what occurred in his case. If, then, after death it was so difficult to trace true peritonitis as the cause of death, how should we be able in all cases to make a diagnosis of peritonitis during life? How natural that a large number really of an inflammatory nature should be mistaken for neuralgia! Such, then, was one class of cases, the result of injuries to the uterus. The second class consisted of cases of true neuralgia. To these belonged the one described by Dr. Engelmann, a case of true neuralgia of the nerves supplying the peritonæum, and such as we saw frequently after childbirth, and not alone in consequence of malaria, for it occurred also in regions where malaria did not exist. It was that kind of neuralgia which occasionally produced blindness and other neurotic affections. In cases in which blindness occurred suddenly after confinement, he thought it had been proven that the optic nerve was dropsical. It was natural that such cases of neuralgia of the peritonæum, for which an explanation could be found in the hydræmic condition of the blood, should occur occasionally out of the puerperal state, but they were seldom met with, compared with the cases of true peritonitis which had all the symptoms of hyperæsthesia of the peritonæum. The third class of cases, which had been described by Dr. Taylor, was that of a true neuralgia of the uterus, but it should be distinguished from the condition known as chronic perimetritis. Time would not permit a full discussion of the subject.

Dr. J. MARION SIMS,* of New York, thought that Dr. Busey had well designated a group of cases of which his was a representative. He had thought that this neuralgic condition was so well understood by the profession everywhere that it hardly deserved to be dignified with a paper specially devoted to its consideration, but the contrary had been proven here to-day. We were all seeing these cases continually, and had attached no great importance to them, because the patients got well; but in so doing we had not done full justice to the subject. He had seen a great many cases of the kind described, but had never associated them with peritonitis. He had always looked upon them as cases of neurosis, and by treating them with hypodermics of morphine the symptoms disappeared in a few hours. He had seen these symptoms develop from the introduction of the tent, from an operation for division of the cervix, and he could now recall two cases which occurred in the same week, in both of which, soon after the operation, the patient was seized with violent diffuse hyperæsthesia of the abdomen, and in both cases there had been high temperature, the patients having come from a malarious district of country. Both were relieved by the prompt injection of morphine and the administration of quinine, and had no paroxysm after the initiatory one. He did not know that the term hyperæsthesia of the peritonæum was a proper one, as the hyperæsthesia usually existed all over the abdomen. He had seen instances in which it attended menstruation. Many years ago Dr. Thomas called him in to see a well-marked case of the kind, in which the patient suffered from the symptoms referred to at each menstruation for many months.

Dr. CAMPBELL wished to say a few words in explanation. He was at first disposed to regard the term diffuse hyperæsthesia of the peritonæum with favor, and to accept it in the place of the term which he had before used, peritoneal tenderness; but the remarks of Dr. Engelmann had confirmed him in his preference for the term peritoneal tenderness. There were cases in which no pathological lesion of the uterus could be discovered, in which, however, if the neck were touched with the finger, a spray of water thrown against it, or in any other manner it were irritated, pain would spread immediately all over the abdomen being a neuralgic condition, the real origin of which he considered to be in the exalted reflex excitability of the cord; he believed the origin of the symptoms was in the spinal cord rather than in the neck of the womb. He was tired of hearing the word malaria—of its charging the air we breathed with the cause of all the affections which showed a tendency to intermittence. He believed intermittence depended upon something else besides malaria; that, being an inherent principle and mode of action in the cerebro-spinal system, it simply meant, when it appeared, that the cerebro-spinal element predominated. Malaria was only one of the blood irritants that excited the cerebro-spinal system to a peculiar manifestation of its tendency to act intermittently. Any centric or any peripheral irritation, as the burning of the finger, would cause the nervous system to complain —but only at times, between which times there would be periods of freedom from pain, more or less complete. Pain and spasm were the most common complaints which the cerebro-spinal nerves ever made against irritation, and they could be expressed only paroxysmally. He believed that the brain and also the organs of special sense were bound by the same law—under ganglionic domination, the kidneys acted, the heart pulsated, and animal heat was maintained from birth to the end of life. Not so, as he had said, with the nervous system of relation. It must have *rest* at night after the day of labor. "Our life is renewed in sleep, and every day lets forth an ever new man through the merciful gates of the morning," as truly wrote Garth Wilkinson.

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* Owing to Dr. Sims's absence from the country, it has been impossible to allow him an opportunity to revise the reporter's notes of his remarks. It is possible, therefore, that the part he took in the proceedings is not adequately represented in this report.—EDITOR.

EXPLORATORY PUNCTURE OF THE ABDOMEN.—Dr. HENRY J. GARRIGUES, of New York, read a paper in which he stated that he had examined the fluid from a large number of ovarian cysts, and had compared it with that taken from other abdominal tumors and with fluid collections in other parts of the body. He discussed myxoid proliferous cystomata in detail, they being by far the most common variety of ovarian cysts. The physical characters were, as a rule, so well marked that the fluid could be recognized simply by its appearance. Viscidity was the most important physical character, although it might be absent in ovarian cysts and found in other cysts. Ovarian fluid did not contain any characteristic chemical element. The coagulability was of a certain diagnostic value. The fluid did not, as a rule, coagulate spontaneously, and when in very rare cases it did so the coagulation took place slowly, not speedily, as in some uterine fibrocysts. The fluid of ascites, as a rule, showed some degree of spontaneous coagulation. By heat ovarian fluid generally coagulated to a great extent, or entirely. The claim that it was characteristic of ovarian cysts that the coagulum was redissolved in boiling acetic acid was utterly unfounded. The microscopical examination was much more important. It was only by studying the cyst wall that the nature and the form of the elements found in cystic fluids could be understood. The elements of greatest importance were the columnar epithelial cells seen in side view. The corpuscles known as Drysdale's granular ovarian cells were merely nuclei in a state of fatty degeneration, and had no diagnostic value. Dr. Garrigues had been able to trace them from the time when they were yet imbedded in the epithelial cells on the inside of the cyst. The spindle-shaped cells, smooth muscular fibers, which had been claimed to be pathognomonic of fibro-cysts, he had found in the fluid of an ovarian cyst. The author claimed that there was no pathognomonic morphological element in ovarian cyst fluid, but that in the great majority of cases ovarian fluid could be distinguished from all others, and that, taken with the facts elicited by the history and the physica examination, an examination of the fluid was of great diagnostic value. He then considered briefly dermoid ovarian cysts, which often contained the same kind of fluid as the myxoid variety. He had found fluid as clear as water not only in cysts of the broad ligament, but also in hydrops of the Graafian follicle—true monocysts—and in an ovarian cyst composed of several compartments. He had not found fluid from sarcomatous and carcinomatous cysts different from that of the more benign varieties. He stated that cysts of the broad ligament could not be distinguished from those of the ovary by an examination of the cyst contents. Complete instantaneous coagulability was characteristic of uterine fibro-cysts, but it had been found only in a minority of cases. Columnar epithelial cells had never been found in uterine fibro-cysts. The differential diagnosis could be based on an examination of the fluid alone in some cases, while in most cases some information could be obtained which would help to clear up the diagnosis. He thought the advantages to be gained by an examination of the fluid were so great that it ought to be made in every case before operating. The greatest danger in aspirating consisted in carrying septic matter into the interior of the body, and that could be avoided by antiseptic precautions. By using a fine cannula, pushing it in slowly, the danger of wounding vessels was very small. All the fluid should be withdrawn, so as to avoid the escape of any remaining fluid into the peritoneal cavity causing peritonitis, etc. The patient should remain abed four days, so as to lessen the danger of peritonitis.

Dr. Sims said he did not rise to discuss the subject, but to congratulate the society on having had added to its contributions a paper of so high a scientific character, and of so great importance in this department of surgery. In importance as a scientific production it was second to none in their volumes of transactions.

Dr. Thomas M. Drysdale, of Philadelphia, agreed fully with Dr. Sims as to the importance of the subject of which Dr. Garrigues's paper treated, but as regarded the author's conclusions he had to differ from him. He had devoted a number of years of labor in this direction, and he still held to what he had taught concerning the pathognomonic value of the ovarian cell. He called it an ovarian cell, but perhaps Dr. Garrigues was more nearly correct in calling it a corpuscle. It would require too much time to discuss the paper in full to-day, but he would try to prepare a paper in reply to that of Dr. Garrigues for the next meeting of the society. He would, however, now refer to the important diagnostic fact, overlooked by Dr. Garrigues, that coagulation of fluid from fibrocystic tumors of the uterus occurred immediately on its removal from the body, while that from ovarian cysts took place very slowly, sometimes not for days.

Dr. Leopold Meyer, of Copenhagen, a member by invitation, said Dr. Garrigues's paper contained so many points of interest that time would not admit of its being discussed in full, but there were two points to which he would briefly refer: First, the possibility of making a diagnosis by a microscopical examination of fluids, and, secondly, how far it was safe to tap patients. One fact, of course, influenced the other; for, if we could expect to form a diagnosis easily from the nature of the fluid, we should be more likely to resort to tapping; and, if there were little danger attending tapping, we should be more likely to resort to this measure in making a diagnosis. His opinion, formed from conversing with gentlemen of different countries, was, that tapping should not be so often resorted to as Dr. Garrigues would have us do. In the first place, it was only in a minority of cases that we could not form a positive diagnosis without resorting to tapping. Again, he thought Dr. Garrigues presented the dangers attending tapping in a little too favorable light. He had seen several cases of laparotomy in which it was perfectly well shown that tapping would have been attended by great danger. He remembered a case in which he had the honor to assist Mr. Spencer Wells at the operation, where the uterus lay in front of the tumor, and to reach it by tapping it would have been necessary to penetrate the uterus. In other cases he had seen large blood-vessels so lying that the trocar could not have been so introduced as to avoid them. He quite agreed with the author, however, that there were some cases in which it was both safe and necessary to resort to tapping.

Dr. Henry P. C. Wilson, of Baltimore, did not rise to discuss the paper, but to express his gratitude to the author for the great scientific value of his paper. He quite agreed with Dr. Meyer that in a large proportion of cases of ovarian tumor we could make out the diagnosis with sufficient accuracy to dispense with tapping. In cases in which tapping had preceded the operation the chances of success had been diminished, so that in cases in which the diagnosis could be accurately made, and in a great many cases it could be done, tapping should be avoided. He lost a patient once because of having aspirated. It made a strong impression on his mind, and he would not again aspirate unless the diagnosis were doubtful.

Dr. George H. Lyman, of Boston, wished to hear the opinion of more of the gentlemen present upon the subject of tapping. His own experience had been limited. In one case, the patient being a healthy woman, tapping was followed by acute suppuration in the cysts. The subsequent ovariotomy resulted fatally, and he was satisfied that she would have recovered had she not been tapped beforehand.

Dr. Barker thought it important that we should fully understand the possible dangers of tapping. Some years ago the wife of a prominent physician of this city was tapped by his associate, the late Dr. Peaslee. There was nothing peculiar with regard to the operation; the patient passed through it well. Two or three hours afterward Dr. Peaslee was sent for, but, as he was not at home, Dr. Barker saw the patient. He found her in a condition of shock and collapse. On examination he was surprised to learn that she had been tapped, for the abdomen seemed very full. He asked if Dr. Peaslee got out all the fluid. They said yes. The patient appeared to him to be dying of shock, and the appearances were very much like those he had seen in shock from loss of blood in puerperal cases. Before Dr. Peaslee got there she was dead. The next day Dr. Barker was present at the autopsy, and it was found that a vein in the mesentery had been punctured in the operation, and the abdomen was filled with blood. Dr. Peaslee had previously written a paper on this subject, which he read before the Academy of Medicine, and he had always shown great prudence and care at all of his operations, yet this accident occurred to the wife of a physician in this city, and Dr. Barker thought, in view of these facts, that we should be fully aware of the dangers attending tapping, and we should hear from men of experience in this direction.

Dr. Emmet said that in his experience it had been the exception for trouble not to follow tapping. He had seen a number of cases in which there had been inflammation of the sac, and adhesions as a consequence, which had complicated the subsequent operation. Tapping should, therefore, be done only exceptionally.

He had seen both the stomach and the transverse colon directly in the line of tapping adherent to the tumor. Two cases had been reported in which the bladder was adherent to the tumor, and would have been transfixed in tapping. As a rule, more or less adhesions formed from fluids escaping into the peritoneal cavity after tapping. His verdict was decidedly against the operation, and even against using the exploring-needle if it could be avoided.

Dr. Alexander Dunlap, of Springfield, Ohio, said it had been his experience in these cases that a diagnosis was more difficult to make after tapping than before. After withdrawing the fluid from the cyst, its walls collapsed, and were difficult to distinguish from the abdominal viscera. He knew a gentleman who felt so certain as to the diagnosis in a case of abdominal tumor that he appointed a day to operate, but, feeling some hesitancy then, he tapped the patient. The abdominal walls collapsed, and he said he would have to postpone the operation until the sac refilled. The displacement of the intestines, etc., by the growth of the tumor, the peculiarities observed by the feel of the tumor, etc., would usually enable one to make a correct diagnosis. Sometimes the intestines, having formed early adhesions, were in an unusual position, and tapping might make the diagnosis more certain, in which case he would not hesitate to perform the operation. Sometimes the size of the tumor made it sufficiently urgent to remove it, but the patient might not have fully made up her mind to have the operation performed; in that case the tumor might be tapped, and relief given until she was fully prepared for its removal. He had had no trouble from tapping except in one case, and in that it was not done for the purpose of making the diagnosis certain. He was already certain as to that, but the patient was not prepared to have the tumor removed, and he tapped it in order to give her relief for the time being. The physician in attendance said she had quite severe pain on the next day, which, however, was quieted by opium; and she got up without any apparent difficulty or trouble. The sac refilled, and in about six weeks after tapping she desired to have the tumor removed, saying that tapping had proved a failure. Without making further examination into the case, the patient having made no complaints, Dr. Dunlap cut directly down upon the tumor, found no adhesions between its walls and those of the abdomen, evacuated the cyst of its fluid, and began to raise up the tumor, but found it fixed. Passing his hand behind it, he found the intestines and the mass agglutinated together, without any chance of separating them. After satisfying himself that there were no small multilocular cysts in the walls of the tumor, he brought the incised walls of the tumor into those of the abdomen, and closed up the opening. He told the patient then that he failed to get the tumor out, that there must have been a good deal of trouble after that tapping operation, and asked her why she did not tell him of it. She said there had been; that the next day she could not walk across the floor, but the doctor gave her some opium, and she had no further trouble. A severe case of peritonitis had been checked by opium. The result of the case was singular. When the tumor refilled after the tapping operation, having become adherent to the intestine by the inflammatory products, it put those adhesive bands upon the stretch, they began to tear, and were at the point of ulcerating when he tried to remove the tumor; and after the woman had got apparently well from the operation, that ulceration went clear through the sac, and let the whole contents of the intestine (gas, fecal matter, etc.) and the fluid of the cyst come together. This mixture fermented, and the fermentation was so great that it actually burst the woman open. Adhesive action took place in the sac, the fistulous opening closed, and within three months the patient got well, and was well to-day, fifteen years after she was tapped.

Dr. Campbell thought the discussion had taken rather a wide range. Dr. Garrigues had referred to drawing off a small amount of fluid for microscopical examination, while the gentlemen who had discussed the paper referred to drawing off the entire quantity of fluid within the tumor with the trocar and cannula. If he remembered aright, Mr. Spencer Wells's success had been slightly greater in those cases in which some previous tappings had been done. When there had been no previous tapping the mortality was 23·4 per cent.; when three tappings had preceded ovariotomy the mortality was only 21·87 per cent. Such were the tabular records on this subject.

Dr. Emmet said there were cases on record in which death had taken place from the introduction of the hypodermic needle, drawing off but a very small quantity of fluid. He himself had had a case in which death resulted after drawing off half a drachm of fluid.

Dr. Taylor said he had had several cases in which tapping had not only done no harm, but, on the contrary, they were benefited or cured, in which the tumor was quite large—as large as the head of a child a year old, and then, increasing in size, became so large as to interfere with motion. The pulse became frequent, and there was disturbance of the stomach, respiration, etc. On introducing the needle to the depth of four or five inches no fluid of any kind was obtained, but the tumors afterward began to subside, and the patients improved in every respect. After two weeks they were able to sit on a chair, and after four weeks the tumor was reduced to its original size—that of a child's head. He did not know what was the explanation or cause of this decrease of the tumor, nor had any author given it. One of the ladies alluded to was to-day healthy and well, although a tumor of the size of a child's head remained.

Dr. Gilman Kimball, of Lowell, Massachusetts, said his rule was to avoid tapping until it seemed necessary, either to save the patient from greater harm by the over-distention of the abdomen, or from the consequences of an ovariotomy. He was called to perform ovariotomy on a patient who had just returned home from a long distance. When he arrived, she was not in a condition for ovariotomy, and, in order to relieve the enormous distention of the abdomen, he tapped her. She died within two or three days, because, he had no doubt, of the escape of the contents of the sac into the peritoneal cavity. That was the only case in which he had had a bad result from tapping. He had removed tumors in several cases after tapping had been performed a number of times, in one instance nineteen times. He had found no evidence of adhesions resulting from tapping. He believed Dr. Peaslee recommended tapping in all cases before performing ovariotomy. He remembered going to see Mr. Spencer Wells perform an operation in London, and in that case he tapped the patient a day or two before the operation in order to relieve over-distention and lessen the danger of shock. Dr. Kimball thought the idea a very reasonable one.

Dr. Engelmann said that, while preparing the paper to which reference had been made before, he received a number of letters with regard to the dangers of inflammation and death following the tapping of ovarian cysts, and, as he never looked upon the tapping of ovarian cysts as a trifling operation, he made no mention whatsoever of these cases in that paper. Personally, he had never had any accidents result from tapping cysts of the ovary or broad ligament, although he had tapped many times. He looked upon tapping as an important means of diagnosis in certain cases, and as necessary in some cases before the operation to make a more positive interference possible. In some rare cases he thought it might afford relief where removal of the tumor was impossible. Tapping might be of scientific interest, but it was not so often of practical importance as one might infer from Dr. Garrigues's paper. He had had two cases similar to those narrated by Dr. Taylor. In one he tapped what he thought was an ovarian tumor, and the patient was speedily restored to health. He withdrew only about half the fluid with a small needle. He saw her a few weeks ago, eighteen months after the tapping, and she said no signs of a tumor remained; that she was perfectly well. In another case the tumor disappeared after tapping. He thought it was a cyst of the broad ligament. Scientifically he thought the paper one of extreme interest, but practically he did not think we should often gain very much by tapping simply for the sake of a microscopical examination of the fluid.

Dr. William T. Howard, of Baltimore, had not intended to say anything on this important subject, but it happened that his experience furnished several instances in which he had had occasion to lament a defective diagnosis. As late as 1878 Mr. Spencer Wells reported in the "British Medical Journal" a case in which, in order to clear up the diagnosis, he tapped, and sent some of the fluid to Mr. Thornton for microscopical examination, who reported that it presented the usual appearances of ovarian fluid, and also contained the characteristic cell. Believing the case to be one of ovarian dropsy, Mr. Wells then proceeded to operate, and, after the abdominal incision had been made, found that he had to deal with a fibro-cystic tumor of the uterus. While attempting to remove it he wounded the rectum, but the patient subsequently recovered. In October, 1879, Dr. Howard saw a woman, twenty-seven years old, who had given birth to a child nine years before, who had an abdominal tumor of two or three years' standing, and of the size of the sixth month of pregnancy. She had had menorrhagia and metrorrhagia since the birth of her child. The uterine sound could be introduced to the depth of four inches. Her health was tolerably good, so that he did not think it proper to operate at that time. In the following February the tumor had enlarged a good deal, and Dr. Wilson saw the case with him. After several examinations then, the conclusion was reached that it was an ovarian tumor, but it was decided not to operate at once. The patient returned to Wilmington, North Carolina, with the instruction that as soon as her general health began to fail she should return for operation. The tumor grew very rapidly, and finally she was unable to lie down; her labia became distended with serum, etc., and he wrote to her to be tapped at once. Her two attending physicians said that it would be of no use, but the patient's mother told them that if they did not do it she would get some one else who would; so they introduced an ordinary thumb lancet and drew off considerable fluid, and soon afterward the patient was able to go to Baltimore, where, in July, 1880, Dr. Howard operated and removed a multilocular tumor of the ovary. That was a case in which, as he thought, the life of the patient was, for the time, saved by tapping. He was opposed to tapping, however, when it was possible to avoid it, for the dangers attending the operation were considerable. Dr. Thomas gave several tables upon that point. One was made by M. Courty, who had collected one hundred and thirty cases treated by Kiwisch, Lee, and Southam, in which forty-six patients died after the first tapping. Another table contained one hundred and thirty-two cases collected by Dr. Fock, of Berlin, and in those twenty-five of the patients died within a few days. All these cases went to show at least that it was not an operation that was free from danger. Dr. Howard had another case last autumn which illustrated the importance of not tapping. The patient had been tapped five times in as many months, under the supposition that the case was one of ascites. He operated in October, and removed a large multilocular ovarian cyst with extensive adhesions. He maintained that had she not been tapped so often the adhesions would probably not have been so extensive. He was glad that Dr. Drysdale had promised to reply to Dr. Garrigues's paper, for, if there was anything in connection with ovariotomy upon which we needed light, it was this very question.

Dr. Drysdale, being requested to speak again, said he had had a large experience in tapping during a number of years past, both in the practice of Dr. Atlee and in his own. He could not recall a single case in which a fatal result followed this operation in the hands of either, nor had he seen any very serious symptoms arising from it; but he had in the practice of others. He always put the patient in the recumbent position before tapping, with the head and shoulders well supported, and a sheet around the body to support the abdominal walls as the fluid came away. These precautions might have had something to do with the fortunate results, but they could not have done away with the danger of meeting blood-vessels. He remembered removing a tumor of the omentum which he had previously tapped, in which he found immense blood-vessels on every side of the point where the trocar had entered. The walls of the tumor resembled a huge placenta. He had seen peritonitis follow simple aspiration in the hands of Keith. He withdrew only a part of the fluid. The same thing was done by a gentleman who gave him some fluid to examine about a year ago. He warned the gentleman of the danger of peritonitis, and it occurred. To withdraw but a portion of the fluid he considered very dangerous. It was then the tendency of the cyst to contract, which forced out some of the remaining fluid into the abdominal cavity, causing peritonitis. He did not regard tapping of abdominal cysts as a dangerous operation, if it were done properly. But it should be remembered that it must be done properly. A woman in Massachusetts had been tapped fifty-two times; her physician made a small incision down through the abdominal walls with a bistoury, and then inserted a female catheter. This was done over and over again, and yet no peritonitis followed. When Dr. Drysdale removed the tumor he found very few adhesions, and those which were present were broken up with ease.

Dr. Dunlap said he did not look upon tapping as a dangerous operation in itself, but he did look upon tapping, and afterward manipulating the bowels for the purpose of diagnosis, as very dangerous. The tumor had been pressing against the abdominal walls; it was tapped, and its walls collapsed, causing a kind of suction force, and the walls of the abdomen followed it; then by manipulating we were almost sure to force out some of the remaining fluid through the puncture into the abdominal cavity, and set up peritonitis. He believed that the means afforded by manipulation and percussion for making a diagnosis before tapping would usually be sufficient.

Dr. James R. Chadwick, of Boston, thought the extreme views which had been expressed regarding the harmlessness and dangers of tapping allowed of a middle ground. It was pretty generally admitted now that the smaller the incision made in ovariotomy the less the danger, and in the same way, it seemed to him, the smaller the tube introduced in tapping the less the danger. It seemed to him also that the danger depended a good deal upon the nature of the tumor or cavity containing the fluid. In the case of ascites, for instance, tapping was comparatively innoxious. He had done it a number of times, and never had any bad results. He had, however, had inflammation of the cyst wall and of the peritonæum follow tapping of ovarian cysts. In such cases tapping was an operation which should not be undertaken lightly. He agreed with Dr. Drysdale that leaving fluid in the cyst was the greatest danger to which we could subject our patient. For the same reason it was objectionable to manipulate for diagnostic purposes immediately after tapping. The advantages of tapping differed according to the nature of the tumor. Some had said that cysts of the broad ligament were cured by tapping; he could not say that that had been his experience. He had tapped two or three, and in each case the fluid had reaccumulated. He thought there must be some element not yet understood in cysts of the broad ligament to account for the reaccumulation of fluid in one, and not in another, after tapping. In tapping an ovarian tumor we did not expect anything more than temporary relief. The danger attending the operation was greater than in ascites, and he did not think it should be undertaken except for some special reason, such as reducing the bulk in order to diminish the dangers of subsequent operation. Last year he mentioned a case in which he drew off one hundred and five pounds of fluid before operation, and on removing the tumor three weeks afterward, it, together with its contents, weighed seventy-five pounds. The woman recovered, but he believed that, had not some of the fluid been withdrawn before the operation, the chances of recovery would have been much diminished. He regarded tapping a fibro-cystic tumor a very dangerous operation. The walls through which the trocar was to pass were thick and full of blood-vessels, and did not collapse. He had seen inflammation result in these cases, and he had also seen the cavity from which the fluid was removed fill up with blood, and dangerous collapse follow. There was one point of scientific interest in this discussion to which he believed Dr. Garrigues had not referred in his paper, and that was the presence of pus in the fluid on tapping. Two or three years ago a woman had been tapped two or three times, and, coming under his care, he tapped her once or twice, as she refused to be operated upon for the removal of the tumor. He was surprised to find at both of these tappings, done at intervals of several months, that the fluid was milky, and that, on examining it under the microscope, it contained pus in large amount, and yet the woman was perfectly healthy in every way, having no inflammatory or other symptoms before or after the tappings. A few months afterward she was taken to the City Hospital in a moribund state, and died. It was found at the autopsy that there had been rupture of the cyst walls and escape of its contents, which resulted in collapse and death. The whole cavity of the cyst showed cicatrized tissue, or tissue in an ulcerating state. These facts suggested that the presence of pus in the fluid drawn from an ovarian cyst, even though pain and inflammatory symptoms were absent, might be indicative of ulcerations of the cyst walls, and, consequently, of imminent danger of perforation, from which only prompt operative measures would protect the patient.

Dr. Noeggerath would say a few words regarding the so-called ovarian corpuscle, which Dr. Drysdale considered characteristic of ovarian cysts, and Dr. Garrigues did not. He thought the position which that question occupied was illustrated by the following incident: He sent a specimen to two of the best men in this country whose names were connected with the subject, and they sent him back the answer that it contained the ovarian corpuscle, and was no doubt symptomatic of an ovarian tumor. Now, what were the facts? The specimen was taken from a suppurating cyst of the thigh, and yet it contained the ovarian corpuscle in such numbers, and in such perfection, that two of the best judges in the country mistook them for it. Dr. Garrigues considered the ovarian corpuscle as the fatty degeneration of a nucleus. Dr. Noeggerath's explanation of the ovarian corpuscle was as follows: In every ovarian cyst there were large granular cells with a nucleus. He had seen the generation of the ovarian corpuscle from these cells. There was a process of development of granular cells, which was called sarcode formation, a budding out of the protoplasm until a certain amount became separated from it; thereupon yon had the old Gluge cell and ovarian corpuscle. This kind of Gluge cell was nothing more than a lymphatic corpuscle which had migrated into the cyst cavity. Now, with regard to cysts of the broad ligament, cysts of the ovary, and parovarian cysts, it could be seen from the illustration on the blackboard that this remnant of the Wolffian body might develop within the broad ligament and form a cyst, called a cyst of the broad ligament, or outwardly toward the abdominal cavity, in which case we should have a parovarian cyst, or a cyst of the broad ligament, not within the broad ligament, but within the abdominal cavity; or, thirdly, it might develop into the ovary, and form a cyst of the ovary, in which case it was still in the broad ligament, for the ovary developed toward and into the broad ligament. It followed from this that the distinction between these three cysts was merely of topographical or snrgical importance. A cyst of the broad ligament had no exclusive characteristic at all. Any kind of ovarian or parovarian cyst might develop into the broad ligament. It would be clear from this that no chemical or microscopical examination of the contents of a cyst would enable ns to tell whether it had developed inside or ontside the broad ligament. For the purpose of diagnosticating the surgical relations of the cyst we had a surer means than tapping. It had been proposed by Professor B. S. Schultze, of Jena. While the patient was lying on a table an assistant pressed down upon the abdominal walls and forced the tumor as high up as possible toward the diaphragm; the operator then passed two or three fingers into the rectum and the thumb into the vagina, and, with the other hand on the abdomen, was enabled to trace the size, the location, and the character of the pedicle of the tumor. With regard to exploratory tapping of ovarian cysts, he considered it absolutely harmless when done with proper precautions; he had done it as many as two or three hundred times. In all cases in which death had followed exploratory tapping, the fault could be traced to the operator. If a small hypodermic syringe were used, which would produce no bleeding, the only danger that remained was inflammation of the sac or of the peritonæum. But what meant such inflammation? This: that the surgeon had carried in with the needle a certain amount of septic material. If the precautions laid down by Dr. Garrigues were fully carried out, there was almost absolutely no danger of exploratory tapping with the hypodermic syringe. Of course, the dangers of tapping with a large trocar were greater than with a small exploratory needle, but still they should be restricted to bleeding and to injury of the intestines.

Dr. Julius H. Gelbke, of Dresden, a member by invitation, said tapping was most important in cases of dermoid cysts, in which there was cell death, and the tumor was filled with a thick fluid. The prognosis after operation for the removal of a tumor in such cases was considered very grave by German physicians —so grave that many of them did not operate at all. Some always tapped ovarian cysts a day or two before the operation, both for the purpose of diagnosis and to see whether the patient would be likely to stand the operation. For tapping dermoid cysts, the fluid being thick, the trocar should not be too narrow. He had seen trouble arise from tapping in but one case—a case of cyst of the spleen. The woman had been tapped six times within a few years; the seventh time the surrounding membranes had become so hardened, petrified, that the trocar slipped off and wounded a large vein. Considerable hæmorrhage took place, followed by collapse, and then peritonitis; still, the woman recovered.

(*To be continued.*)

NEW YORK OBSTETRICAL SOCIETY.

A regular meeting was held June 7, 1881, Dr. James B. Hunter, President, in the chair.

Cyst in the Anterior Wall of the Vagina, formed from Gärtner's Canal.—Dr. Robert Watts reported the case of a woman, forty-one years old, who had been married twenty-four years, and had borne eight children. She stated that she had always enjoyed good health. Three years ago she first noticed a "lump" protruding from the vulva, her attention having been called to it by some scalding and the occasional need of considerable straining in micturition. The swelling gave rise to no pain, and could be returned within the vulva. It troubled her only by "being in the way" when she stood or walked. A few weeks before she applied for treatment, while exerting herself in some way, she felt a sharp pain in the lower part of the abdomen. This was followed by fever, and she was confined to her bed for several days. On examination the anterior vaginal wall was seen bulging out from the vulva, appearing like a cystocele. The swelling was elastic and fluctuating, about as large as a hen's egg, somewhat flattened antero-posteriorly, and largest at its dependent portion. It could be pushed back into the vagina, but the least straining immediately caused it to protrude again. Examination with a sound in the bladder failed to detect any communication between that organ and the swelling. The introduction of a hypodermic needle showed the tumor to be a cyst containing a sero-purulent fluid. It was situated in the anterior vaginal wall, in the median line. Firm pressure failed to empty it of its contents. With the patient in Sims's posture, the contents of the cyst—about two fluidounces—were removed with a hypodermic needle, and it was then distended with water to render its removal easier. An incision was made through the vaginal wall, which was quite thick, down to the cyst, which was then enucleated with considerable difficulty, being firmly embedded in the surrounding tissues. After freeing the lower portion of the cyst, and in order to determine its upper limit exactly, an opening was made into the lower end, and a probe was introduced, which, to Dr. Watts's great surprise, passed in several inches without meeting with the slightest resistance. The probe passed to the left, and its tip could easily be felt at a point about on a level with the umbilicus and midway between it and the anterior superior spine of the ilium—apparently just beneath the abdominal wall. On careful examination of the cyst it seemed to run up and become converted into a tube, and, as this evidently communicated with the peritoneal cavity, a stout ligature was tied around it, and the lower portion of the cyst, which had been enucleated, was cut off. The bladder was then carefully explored with a sound, but no opening could be found in it. It contained a small quantity of bloody urine, which was removed with a catheter. The point at which the cyst was severed was just above the reflection of the vagina from the bladder to the cervix, and the lower end of the tumor was about half an inch behind the meatus urinarius. There was considerable oozing of blood from the bed of the cyst, and the cavity left by its removal was therefore irrigated with hot water, and swabbed with tincture of iodine. A small tampon of cotton soaked in a saturated solution of alum was then placed in it. A short time after the operation there was a sharp hæmorrhage from the upper part of the cavity, but, as no bleeding vessel could be found, it was controlled with a tampon. For two days the urine contained considerable blood, but after that time it was perfectly clear. The patient was now going about, having had no untoward symptom, and the cavity was gradually contracting.

Dr. Watts then read the *Pathologist's report* upon the portion of the cyst that was removed, and the fluid that had been withdrawn from it. The report termed the tumor a vaginal cyst formed by Gärtner's canal. The specimen consisted of a long, narrow bag (seven centimetres long and three centimetres wide), the walls of which were in contact. At the upper end, where it had been severed, a short neck was found, situated toward one of the lateral edges, so that one of the edges of the neck was a direct continuation of the edge of the body, while the other formed a sharp curve approaching a right angle. The outer surface of the bag was rough; the inner surface was smooth and shining, of a reddish-yellow color, and showed about a dozen recesses. The smaller of these were round and as large as hemp-seeds; the larger ones formed crevices extending almost transversely on either wall. The whole interior (body, recesses, and neck) was lined with flat, stratified epithelium. Part of the body was treated with Müller's fluid, alcohol, and absolute alcohol, and cut transversely. The epithelium had been lost; the rest of the wall was composed of three layers. The outer layer was rather thick, and made up of wavy, fibrous connective tissue, the main course of the fibers being circular. Prolongations extended between the muscular bundles of the middle layer. This middle layer was by far the thickest. It was formed of smooth muscular fibers, and, as regarded the direction of the fibers, it might be subdivided into three zones. The outermost was a zone of large longitudinal bundles, cut across in the section. Inside of this was a zone of circular bundles. In both these zones the bundles were thick, and packed close together. The innermost zone was made up of small bundles separated by considerable connective tissue, and running in various directions, but for the most part longitudinally, as in the outer zone. Both in the outer layer of connective tissue, and in the middle (muscular) layer, arteries were found cut across. The innermost layer was comparatively thin, and composed of connective tissue crowded with small, round cells. This layer contained many capillaries, and in some places extravasated red blood corpuscles were seen. The *fluid* from the sac was of a dirty greenish-yellow color, sero-purulent, not viscid, of decidedly alkaline reaction, and smelling of the ether used as an anæsthetic. The quantity was too small for the specific gravity to be ascertained. It did not coagulate spontaneously, and but slightly on boiling, even after the addition of acetic acid; the precipitate was scarcely changed by boiling with an excess of the same acid. With the microscope the field was found full of bodies; some of these were globular cells from eight to thirteen micromillimetres in diameter, with single nuclei; others were free nuclei with shining or dark-colored granules. Acetic acid did not reveal any multinuclear cells. The character of the fluid, together with the condition of the internal or mucous layer, showed that this membrane was inflamed, and that, sooner or later, an abscess would have been formed.

Cysts in the vagina might vary widely in their origin. The existence of sebaceous follicles in the vagina, claimed by von Preuschen, not having been verified by anybody else, it was doubtful if there were simple retention cysts. Those that had been taken to be such were considered by Klebs to be dilated lymph vessels. Veit had referred to the possibility that vaginal cysts might be due to remnants of the Wolffian ducts. Sometimes they were dermoid cysts. Some of them did not properly belong to the vagina, but took their origin in the circumvaginal connective tissue, and might be due to hæmorrhagic effusion or to the formation of a kind of hygroma. Perhaps some of them were developed from glands about the urethra; others seemed to be formed originally by a diverticulum of the urethra (see Breisky, "Die Krankheiten der Vagina," § 105, p. 132; Billroth's "Handbuch der Frauenkraukheiten," 7ter Abschn., Stuttgart, 1879). According to Ruge (*ibid.*, § 110, p. 136), they always had columnar epithelium, but in this case the epithelium was composed of flat cells with central nuclei, overlapping one another, and the largest measuring twenty-seven micromillimetres. In a case examined by Mayer (*ibid.*, § 104, p. 131), the inner surface was covered with small-celled flat epithelium, and in the recesses columnar epithelium was found. In our case the recesses had flat epithelium. In this case, the Pathologist had no doubt, we had to do with a Gärtner's duct. It was evidently some long canal, the lower end of which had been especially distended. It could not be a ureter, for it did not open into the bladder, nor did the upper part lead to the kidney, but more toward the left iliac fossa, where the sound could be felt through the abdominal wall; neither could it be the Fallopian tube, for both its situation and its structure differed entirely from those of that organ.

Gärtner's ducts were found, one on either side of the vagina, in the cow and in the sow. Chauveau* described them, in the cow, as mucous ducts opening into the cavity of the vulva, by the side of the meatus urinarius, and extending upward in the lateral part of the vagina a distance of six or eight centimetres beyond the os uteri. Milne-Edwards † thought that Gärtner's canals were analogous to the peritoneal tubes found in crocodiles. In these animals, on either side of the dorsal furrow of the penis in the male and the clitoris in the female, was found a membranous tube, formed by a prolongation of the peritonæum, and *opening into the peritoneal cavity.* It terminated below in a cul-de-sac near the glans, or opened externally by a small aperture. Perhaps there existed such a free communication with the peritoneal cavity in this case; at least the sound, held by a skilled hand, did not meet with any resistance. Gärtner's canal, found normally in some animals, was nothing else than Wolff's duct, an organ found in early embryonic life. In men it was developed in the course of time into the long canal running through the epididymis and the vas deferens; in women it disappeared, but still Kölliker had found distinct remnants of it in the broad ligament of mature embryos, and Beigel had shown them in an embryo of seven months, running, in the form of small epithelial tubes, toward the side and somewhat forward, in the superficial layers of the wall of the uterus. How far they extended downward could not be seen in the specimens, and it would require an exact and troublesome examination to ascertain when and how they disappeared.*

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* "Anatomie Comparée des Animaux Domestiques," 3ème éd., Paris, 1879, p. 970.

† "Leçons de Physiologie et d'Anatomie Comparées," Paris, 1870, vol. viii, p. 510, vol. ix, p. 68.

The Pathologist added that he had looked in vain for a detailed description of Gärtner's canal, but the structure of the cyst in this case corresponded entirely with that of the vas deferens—an outer coat of connective tissue; a middle coat of organic muscular fibers arranged in three layers (the outermost with longitudinal fibers; the middle, much thicker, with circular fibers; and, again, an internal layer, much weaker than the outer one, with longitudinal fibers); inside of this a mucous membrane lined with epithelium. Even the yellow color and the diverticula in the wall, characteristic of the lower part of the vas deferens, were present. The only point which did not correspond was the character of the epithelium. The vas deferens had columnar epithelium, while this cyst had stratified flat epithelium; but we should bear in mind, first, that we did not know what the character of the epithelium of Gärtner's duct was, and, secondly, that we had only the lower and wider vaginal part of the cyst for examination. Possibly the narrow part of the canal, left in the subject, had columnar epithelium. In every other respect the analogy with Gärtner's duct was so great, both in regard to situation and in regard to structure, that he thought there could be no doubt about the identity of the two.

Dr. Watts said that, two years ago, he reported a somewhat similar case. The cyst in that instance was very large, and had been developing for six years. It contained ten ounces of fluid, having a yellowish color and a syrupy consistence, contained a large amount of cholesterine and some granular matter, and the wall was lined with cylindrical epithelium. He attempted to enucleate it, but failed, and then undertook to clip away the cyst wall, and succeeded in removing all but the upper part, where it seemed to extend into the peritoneal cavity, although he failed to detect any communication by means of a probe. In that case the wound healed except at the extreme upper portion, where a small fistulous opening remained at the time the patient was discharged from the hospital.

Fecal Tumor Diagnosticated to be Ovarian.—The President presented a specimen with the following history: A married woman aged twenty-five, who was the mother of one child and had had one miscarriage—six weeks previously—was admitted into the Woman's Hospital. Since the miscarriage she had noticed a certain amount of abdominal enlargement, and on examination a tumor was detected in the lower part of the abdomen. Fluctuation was distinct, and there was apparently a cyst of considerable size, with intestines covering it. The President believed that it was an ovarian cyst. The woman, however, had phthisis, her general condition was very bad, with high temperature, emaciation, etc., and he declined to operate. The patient accordingly was sent to the New York Hospital, where she was admitted on the 9th, and died on the 18th of April. At the autopsy the small intestine was found adherent everywhere, and, with the stomach, was crowded upward by a sac below, which had been formed in a mass of plastic exudation, contained fluid and a large quantity of fecal matter, and communicated with the small intestine. The cæcum and colon were in their normal position. The large intestine contained tubercular masses. There were tubercular masses in the lungs also, and an abundance of old pleuritic adhesions. The heart was covered with false membrane. The stomach and duodenum were normal. The uterus was longer than normal, and was almost completely surrounded by the cyst. The ovaries were somewhat compressed, but easily seen on each side of the uterus. The liver was fatty. The kidneys were large, their pelves were distended, and they contained a few tubercular masses. ═══ Dr. H. J. Garrigues thought that the cyst was the result of a chronic process, and that the ulceration and perforation of the intestine, establishing a communication with it, occurred subsequently. ═══ Dr. T. A. Emmet remarked that the case exemplified the difficulty which sometimes existed in making a correct diagnosis. He thought that resonance on percussion in front would give rise to the suspicion of a renal rather than an ovarian cyst. ═══ The President remarked that he supposed there was a coil of intestine above the cyst, which gave rise to the resonance. ═══ Dr. Emmet said that such a condition of things might exist. It was not the rule, however, to get resonance in front in connection with an ovarian cyst. ═══ Dr. P. F. Mundé asked if it would not be proper in such a case, provided the diagnosis could be made, to treat it by incision and drainage. This, of course, would result in the establishment of a fecal fistula. ═══ Dr. F. P. Foster suggested that an operation for artificial anus could afterward be done. ═══ Dr. Emmet said that the first and the great obstacle was the difficulty in making a correct diagnosis. Unfortunately, the condition of affairs could not be discovered until the autopsy was made.

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* Kölliker, "Entwickelungsgeschichte des Menschen," 2te Aufl., Leipsic, 1879, p. 986.

Depressor for Sims's Speculum.—Dr. Garrigues exhibited a modified tongue-depressor which he had used satisfactorily as a depressor in connection with Sims's speculum. It could be held with the same hand with which the speculum was held, and could easily be cleaned. ═══ Dr. Foster showed a self-retaining depressor that he had sometimes found convenient. By means of a set-screw it could be clamped upon a large wire ring at any part of its extent, so as to act in any desired direction and with any required depth of penetration. The ring itself also served the purpose of keeping the nates apart, and was attached to the shank of the speculum by a catch.

Blighted Embryo.—Dr. Foster presented an ovum that had been expelled by a lady who supposed herself to be three or four months advanced in pregnancy. The size of the ovum as a whole supported this idea, but the embryo was only about an inch long. The only explanation he could suggest of this disproportion was, that the embryo had been checked in its development at an early period—perhaps had actually died, while the remainder of the ovum maintained a vegetative sort of life and kept on growing in size, although manifestly, as there was no attempt at the formation of a placenta, its growth was not accompanied by a corresponding development.

Cyst of the Labium.—The President narrated a case in which he had to deal with a dense cyst in the left labium, which had been troubling the patient for three or four years. It had been tapped several times, but had filled again. He opened it and found that it contained dark, grumous, glairy fluid. With difficulty he succeeded in dissecting out the cyst, and was obliged to ligate several vessels of considerable size during the operation. He had not usually found such cysts to contain anything except clear fluid. The tumor gave the patient no inconvenience except that caused by its size. ═══ Dr. Emmet remarked that labial cysts sometimes extended upward a very great distance; and cited one which went so far under the ramus of the pubes that he was unable to remove it wholly. He had had two such cases, in both of which the cyst was situated in the left labium, and it was impossible to follow them to their termination. ═══ The President said that in his case the cyst extended upward and downward much farther than was anticipated, and, consequently, it was very difficult to remove it. ═══ Dr. Emmet stated that he had not treated these cysts satisfactorily except by extirpation. If tapped, they were apt to refill; to suppurate, if injected; and, if packed, a slough was liable to be produced. ═══ The President remarked that he had considerable difficulty in controlling the hæmorrhage in his case, because the tissues were so yielding. ═══ Dr. Emmet said that the only way to arrest the hæmorrhage, and get union by first intention in a great part of the wound, was to introduce deep sutures. ═══ The President said that he was able to control the hæmorrhage only by the use of deep sutures. ═══ Dr. Byrne said that he had treated a similar cyst by introducing a trocar into the lower edge, and, after removing its contents, pushing the instrument through the upper end, and then inserting half a dozen threads of silk, tying the ends, and drawing a fresh portion of the silk into the cyst every day, after it had been wet with the tincture of iodine. During the first week there was considerable suppuration, the discharge taking place from the lower opening, but the wound soon healed entirely and the silk was removed, the cyst having become obliterated through inflammatory action. ═══ Dr. Emmet said one difficulty was, that the tissue covering these cysts was so thin that exciting inflammation within the cyst was liable to be followed by sloughing. He had had that accident occur when he had emptied the cyst and stuffed the cavity with lint. ═══ Dr. Byrne thought the liability to sloughing would be much greater after packing the cavity with lint than with the method he had mentioned. ═══ The President said that on the vaginal side the tissue covering the cyst, in his case, was exceedingly thin. ═══ Dr. Emmet remarked that such tissue sloughed very readily.

Pilocarpine in Puerperal Convulsions.—Dr. G. T. Harrison referred to a case of puerperal convulsions in which, at the suggestion of Dr. Gillette, he gave one dose of $\frac{1}{6}$ of a grain of the muriate of pilocarpine hypodermically, and the phenomena developed by the remedy were alarming. Its action on the skin was only slight, but the collection of mucus in the throat was so great that the patient was in positive danger of suffocation, and it was exceedingly difficult to remove it. ═══ The President asked if the dose was not rather large. ═══ Dr. Garrigues thought it was only of moderate size, and that $\frac{1}{3}$ of a grain was sometimes used. ═══ Dr. Watts said that he had not used the remedy in puerperal convulsions, but regarded it as dangerous when the patient was unconscious from any cause, because it almost invariably produced an excess of secretion in the fauces, and there was the risk of the patient choking to death. He had seen it administered in uræmia from Bright's disease, and the risk of the patient dying from suffocation had been very great. He thought that it was contraindicated when the patient was unconscious.

Joseph E. Janvrin, M. D.,
Henry D. Nicoll, M. D.,
Frank P. Foster, M. D., *ex-officio*,
Committee on Publication.

NEW YORK CLINICAL SOCIETY.

A regular meeting was held March 25, 1881, Dr. F. P. Foster Chairman for the evening.

Partial Resection of the Auricular Cartilage.—Dr. E. T. Ely presented a boy sixteen years old, with congenital malformation of both ears, upon one of which he had performed an operation. The auricles were very large, and presented, to a rather unusual degree, the common deformity of standing out very prominently from the side of the head. This gave the boy such a grotesque appearance that he insisted upon being relieved. On the posterior aspect of the auricle, at its junction with the head, a crescentic piece of skin and cartilage was cut out. The lips of the wound were brought together with sutures, four of which were passed through the cut edges of the cartilage. When the incised surfaces were brought into apposition the ear not only appeared reduced in size, but stood in a natural position against the side of the head. Union was perfect, without chondritis or other accident. The result was admirable. Dr. Ely mentioned that the usual mode of operation was to abrade the skin on the posterior surface of the auricle and on the corresponding surface over the mastoid process, and thus secure the ear to the side of the head by agglutination. He believed his operation to be a new and justifiable one. Photographs were presented showing the contrast after one ear had been relieved.

Non-Uræmic Puerperal Convulsions.—Dr. A. A. Smith reported a case of puerperal disease in which convulsions, like those of uræmia, and death resulted. There was no uræmia, and the speaker explained the convulsions as having been caused by shock due to extreme pain. A complete and accurate history of the case would be furnished at a future date.

Aspiration for Empyema.—Dr. W. H. Katzenbach related the history of a case of empyema in which aspiration had been performed with most gratifying results. ═══ Dr. Smith believed that aspiration by means of a simple hypodermic needle often induced absorption, and in many cases after once introducing the hypodermic needle further aspiration was unnecessary.

Platt's Chlorides.—Dr. C. B. Kelsey showed a solution known as "Platt's Chlorides," and recommended it as a valuable disinfectant. ═══ The Chairman and others stated that they had used the preparation, and had found it very satisfactory. ═══ Dr. G. A. Spalding described a cheap and simple method of making a good disinfectant, the formula for which was: Nitrate of lead, ʒj; chloride of sodium, ʒij; water, about a pailful.

A regular meeting was held April 22, 1881, Dr. Robert Abbe Chairman for the evening.

Purpura.—Dr. A. A. Smith mentioned a case which had come to his notice in a girl of ten years. The child's father was in perfect health. The mother was anæmic, feeble, and affected with naso-pharyngeal catarrh. She had had several children and one abortion, and on each occasion suffered from severe flooding. The patient was an excitable child, anæmic, marble-like in appearance, and, though plump, of flabby flesh. From infancy she had had indigestion and catarrh. Thirteen months ago the purpuric eruption first appeared, the history being similar to that of the present attack, which was as follows: After an attack of indigestion, produced by improper food, she had pain in the stomach, also in the knees, with slight fever. This continued a week, and she was then seen by Dr. Smith. The pulse was 112; temperature 101° F. There was slight dizziness. She had acute pharyngitis with enlarged tonsils and elongated uvula. There was a tumefied condition of the posterior pharyngeal wall. A purpuric eruption was present, varying from a tan-color to a bright red. The extravasations were all small. She had never had hæmorrhages from any mucous membrane. Ergot had been used three months, and, as usual in Dr. Smith's experience, no benefit was derived. Half-drachm doses of tincture of chloride of iron had been given for a week without result. He thought the eruption in this case to be simply a symptom of some blood or nerve derangement. Quinine and pepsin had proved most beneficial. ═══ Dr. G. H. Fox knew of no other common affection of the skin regarding the cause of which there was so little known. He would designate this case purpura simplex to distinguish it from purpura hæmorrhagica. It was in the latter variety chiefly that ergot had been useful. In the simple variety tincture of chloride of iron, cod-liver oil, and attention to hygienic measures gave the best results. Examination of the blood-vessels had thrown no light upon the pathology. ═══ Dr. D. B. Delavan had recently seen four cases of purpura, all occurring in females as the result of bad food in a low condition of the system. ═══ The Chairman had seen two cases of purpura attending the use of iodide of potassium, always coming on a few days after beginning the use of the drug, and disappearing with its discontinuance. He had tested the relation between the two, six times in one case, three or four times in the other. Dr. Smith mentioned quinine and bromide of potassium as capable of producing the eruption. In his case he was able to note a relation between the brilliancy of the eruption and the aggravation of the indigestion. He had examined the blood microscopically, and found an increase in the white corpuscles, but was uncertain as to diminution of the red ones. He did not regard such examinations, however, as usually conducted, as of much importance.

Typhus Fever.—Dr. Delavan gave some facts relating to a case of typhus fever. The patient was a partial paralytic, who fell, striking her head. Three days later she was seen by Dr. Delavan, the House Surgeon having suspected fracture at the base of the skull. The temperature was 104·5° F., and there was drowsiness. The face was pale, with a tinge of pink, and the tongue was coated. During the day the stupid condition grew more marked, and she became almost comatose. The arms, hands, and fingers were kept in constant motion. An examination of the abdomen failed to show the characteristic eruption. ═══ Dr. R. F. Weir mentioned the case of a man who had been brought to the New York Hospital in a condition of coma, for a suspected injury, as marks of contusion were seen on the forehead. He had a temperature of 104°. The dusky rash of typhus fever was on his body. He died in twenty-four hours. ═══ Dr. E. T. Ely spoke of a man who entered Charity Hospital, complaining of impaired vision, saying he was short-sighted. A careful ophthalmoscopic examination revealed no cause for his complaint. On the following day a copious typhus-fever eruption appeared.

Perityphlitic Abscess.—Dr. E. L. Partridge related a case of perityphlitis with abscess. The history obtained when the patient was first seen, on the 12th of March, was that on the 10th he was seized with colicky pains, shooting over the abdomen, radiating, however, from the right iliac fossa. During twenty-four hours they were unabated. The illness followed the fatigue and exposure to cold incident to a railway journey. Two years previous he had had an attack of perityphlitic abscess which occasioned an illness of ten weeks. On March 12th the pain had largely abated, and an ill-defined mass as large as an egg could be felt in the right iliac fossa. During the following five days there was no pain, no fever, and the pulse was 80. Tenderness existed over the cæcum, and the mass became more defined and larger. During the next four days the symptoms remained unchanged, excepting that the pulse ranged between 84 and 94, and the temperature was in the vicinity of 102°. No pain was present, and the tenderness was about as before. On March 22d (the twelfth day) the existence of pus seemed to be sufficiently assured. The aspirator demonstrated it, and the customary operation, through skin, subcutaneous tissue, fascia, muscle, and transversalis fascia (Dr. H. B. Sands being present), allowed the escape of about six drachms of pus. The cavity of the abscess was explored with the finger, and no foreign material was present. The pus was not very offensive. Convalescence was rapid, the patient sitting up in ten days, going down-stairs in fourteen, and out of doors in eighteen days. Five days after the operation the abscess showed a disposition to point through the cicatrix of the operation of two years previous, which was situated three fourths of an inch below the recent incision. Two days after, an incision was made through the old scar, notwithstanding free drainage was kept up with tubing in the first incision. A free communication existed between the two openings. Neither before nor after the operation was it necessary to give any anodyne. The bowels acted every day throughout the entire illness, their action being aided with the compound licorice powder of the German pharmacopœia. The pointing through the old cicatrix was believed to be due to the tendency of cicatricial tissue to break down upon slight provocation, the inflammatory action in close proximity being sufficient in this case to produce its ulceration. ═══ Dr. Weir alluded to one of the late Dr. Buck's cases, in which there was no elevation of temperature, and the pulse did not rise above 80. He had seen one case in which there were no acute symptoms. He thought the pointing through the old scar was produced in the manner mentioned, and cited Sir James Paget as authority for such an opinion concerning residual abscesses in cicatricial tissues in general. He had once seen a traumatic abscess on the left side, similar in every respect to an iliac abscess. ═══ Dr. Partridge mentioned the existence of resonance over the abscess, although there was no gas within it. ═══ Dr. Weir had observed such resonance, and thought it was regarded as conveyed from adjacent intestine. ═══ Dr. Smith had seen tympanitic resonance over a hepatized lung, conveyed from the stomach. ═══ The Chairman thought the amount of resonance over an abscess, when conveyed from adjoining intestine, would be in relation to the degree of tension of the abscess wall.

Hydrocele and Hæmatocele.—Dr. Weir made some comments on the treatment of hydrocele and hæmatocele. He had effected radical cure of the former by Volkmann's method of treatment in eighteen cases, viz., laying open the sac with Listerian precautions. In one case of hæmatocele, in which several tappings had failed to relieve the patient, the sac was opened, the laminated fibrine was scraped off, as were also several spots of ulceration from which the hæmorrhage apparently recurred, and the other steps advised by Volkmann and Gäntzmer were strictly followed. Recovery was complete in three weeks, notwithstanding great thickness of the tunica vaginalis. In a second case, one of hæmatocele on one side and hydrocele on the other, both of traumatic origin, the former was treated as in the case above mentioned, with a similar happy result. For the hydrocele, however, a modification of Volkmann's method was made, of simply penetrating with a large trocar, removing the fluid, and injecting the cavity of the tunica vaginalis with a one-to-fifteen solution of carbolic acid, to which a little alcohol or glycerine was added to perfect the solution. Through the cannula, before its removal, a small drainage tube was inserted, and the antiseptic jute dressings were applied. The tube was removed on the fifth day. Recovery was prompt, and the cure was perfect. The speaker had operated in this way six times, with a satisfactory result. The operation was slight and did not demand ether, and recovery took place in less than a week, and—so far as such a small number of cases warranted—the method might be said to be efficient. Stronger injections had been made into the cavity of a hydrocele, as by Levis, of Philadelphia (one part to three), but considerable disturbance had followed at times. Dr. Weir's intention was to carry out Volkmann's idea without so much incision of the scrotal tissues.

Cancer of the Prostate and Bladder.—The Chairman briefly related a case of hypertrophy and cancer of the prostate and bladder, with vesical calculus. The patient was eighty years old, and his first symptoms appeared three years before his death. During the early part of the illness he had frequent micturition, increasing during several months, until the intervals were only an hour or two either by day or by night. There was no bladder pain, and the urine was normal. Examination showed the prostate hypertrophied to the size of a hen's egg, smooth, hard, inelastic, and protruding into the bowel, but producing no tenesmus. The man's general condition was good. After he had passed his urine, a tumblerful of residual but normal urine could be removed with a catheter. Daily use of the instrument was advised, and was attended with immediate and very great relief. Moderate urethritis lasted a short time. Exploration for stone revealed nothing. The patient remained very comfortable for four months, when, in January, 1879, he had an attack of renal colic, with lumbar pains, chill, nausea, and the passage of a large quantity of pale urine. No gravel was passed, but in twelve hours the pain suddenly abated and the urine became natural in quantity and quality. In March, 1880 (having been quite comfortable in the interval), he began to be dull, irritable, and constipated, with a loaded tongue. Three months later he began to have pain in Scarpa's space, with, two months later (August, 1880), dull pelvic and supra-pubic pains and an occasional tinge of blood at the end of urination. He was sleepless at night and torpid by day; his appetite was poor, and there was occasionally an unaccountable chill. The prostate was growing perceptibly larger. Two months before his death there was hæmaturia from catheterization, without evidences of pain or rough usage. Two weeks before death the insidious changes betokening pyelo-nephritis began: complete anorexia, emaciation, dry and furred tongue, and drawn and torpid skin. The urine showed large deposits of pus with very little mucus. Ten days before death the bladder pains passed unnoticed by him. There was no tenderness over the kidneys. Two days later the urine increased in amount to five pints daily, and was free from casts, but contained a small quantity of albumen, with increasing deposits of pus. On the fourth day preceding death a small teacupful of pale, purulent, and sweetish urine was drawn, and soon after a chill and vomiting accompanied suppression of urine. Up to the end no casts were discovered. During the last two days there was intense drowsiness, with muscular spasms of the face and extremities, culminating in convulsions and death. Post-mortem examination showed both kidneys (especially the left one) filled with pus and their capsules adherent. The walls were thin, granular, and speckled with small ecchymoses and abscesses. A small stone was found in the bladder.

Edward L. Partridge, M. D., *Secretary.*

STATEN ISLAND CLINICAL SOCIETY.

A REGULAR meeting was held September 5, 1881, Dr. A. L. CARROLL, President, in the chair.

The PRESIDENT read a paper on CHRONIC PERITONITIS. (See Original Communications in this number of the journal.) In the discussion which followed the reading of the paper, Dr. W. C. WALSER related a case of uterine fibroid in which general peritonitis with effusion occurred. Three years after the occurrence of peritonitis a post-mortem examination revealed carcinoma of the peritonæum. He said he thought it possible that, in the case which Dr. Carroll had reported, the inflammation had extended from the pleurisy of the left side, perisplenitis arising first, followed by perihepatitis, and this by general peritonitis. He then asked if the pressure of the effusion upon the lumbar plexus would account for the paralysis. ═══ Dr. CARROLL replied that he thought the localized deposit might have caused the irritation which preceded the paralysis, and that the contraction which followed after the deposit became organized probably caused the abatement of the paralysis. ═══ Dr. WALSER said the condition of the liver was similar to that found in sclerosis. ═══ Dr. CARROLL thought the condition of the liver was entirely secondary, and due to perihepatitis.

Letters to the Editor.

LITTLE'S COMBINED TABLE AND LOUNGE.

48 EAST 30TH ST., NEW YORK, *Nov.* 3, 1881.

Editor of the New York Medical Journal:

DEAR SIR: In your issue of the present month I see that Dr. Little feels aggrieved that I should have mentioned, in a former article, a lounge and instrument-case without mentioning, at the same time, his name as the inventor of both.

With regard to the lounge, I do not know of any law in our profession which compels a man to trace the entire history and give a complete bibliography of everything he may casually refer to; and certainly my reference to both these things was of the most casual kind. In fact, while writing the article in question my mind was a good deal more fixed upon how to see or feel about eight inches up the human rectum than upon Dr. Little's, or any other man's, cabinet-work.

Were it not for one sentence in the doctor's communication I should hardly feel called upon to answer it at all, since he has claimed his own invention and nobody disputes his claim; but, when he says "permission was given Dr. Kelsey to publish both lounge and instrument-case in his article, but it was expressly understood that I should have due credit given me as the inventor," we touch upon more delicate ground, and I must in justice say that on this simple point either his memory or my own is greatly at fault. I suppose he must mean that, on account of our invariably friendly relations, *if I had* asked him for permission to publish these things he would have granted it, with the proviso that he should have the credit; but the truth is, I never did ask him, and for several reasons: First and foremost, because the idea of the article was conceived and executed while he was in Europe; and, secondly, because he had already published the lounge in the "Medical Record," and I had no occasion to ask his permission to refer to it in a subsequent publication.

Regarding the instrument-case, I should merely like to ask what there is about it which entitles him to the claim of inventor. It never struck me as anything more than a simple box with drawers and a sliding cover. That's all mine is, and mine is a good deal more elaborate box than his. Still, having been used, ever since I began to study medicine, to the idea of some kind of a table with drawers, for convenience in surgical dressings, and having seen many such in hospital wards, operating rooms, and private offices, no two of them alike, I failed to appreciate that surgical art was in any way the richer for the fact that Dr. Little had had still another one made for his own use, or that I had had a different one still for mine. Had I really cared to know who invented his box I should probably have asked for the name of his carpenter, such was my ignorance of the importance which he seems to attach to the thing.

I am glad, however, to have this opportunity to acknowledge the obligation I am under to Dr. Little for many valuable hints from his storehouse of practical knowledge. In the same number of the journal in which his grievance appears, I took particular pains to bring back the question of the immediate dressing of fractures in plaster (which somebody on the other side of the water seems to have recently discovered to be a good thing) to its original introducer in this country, Dr. J. L. Little. I should have done the same in regard to some points in the operation of median lithotomy, and some other things in which the doctor's reputation is well known. But when it comes to introducing his name as the "inventor" of a box for holding towels and ointment pots—with the utmost desire to do ample justice to everybody, my pen hesitates.

Yours truly, Charles B. Kelsey, M. D.

Reports on the Progress of Medicine.

MONTHLY REPORT ON OBSTETRICS AND GYNÆCOLOGY.

No. XI.

By FRANK P. FOSTER, M. D.,
PHYSICIAN FOR DISEASES OF WOMEN TO THE OUT-PATIENT DEPARTMENT OF THE NEW YORK HOSPITAL.

Obstetrics.

1. Cohnstein.—Ueber Praedilectionszeiten der Schwangerschaft und Sterilität. "Arch. f. Gynäk.," xviii, 1, 1881.
2. Rendu, J.—Grossesse nerveuse arrivée à terme; début du travail. "Lyon Méd.," Sept. 25, 1881.

3. Hicks, J. B.—On uterine contractions. [Letter.] "Lancet," Sept. 24, 1881.
4. Broussin.—Note sur la rétention d'urine au début de la grossesse. "Arch. Gén. de Méd.," Sept., 1881.
5. Phelippeaux.—Considérations sur certains avortements. Valeur étiologique du choc moral.—Faits à l'appui.—Accouchement prématuré à 6 mois. —Bassin oblique ovalaire reconnu sur le vivant. "Ann. de Gynéc.," Sept., 1881.
6. Christian, E. P.—The parturient history of some aborters. "Detroit Lancet," Oct., 1881.
7. Smith, T. C.—Poisoned by tansy taken to procure abortion. "Detroit Lancet," Oct., 1881.
8. Piccinini, R.—Esame critico di una perizia medico-legale per aborto. "Giorn. Internaz. delle Sci. Med.," iii, 6, 7, 1881.
9. Marchal.—De la grossesse cervicale. "Union Méd.," Oct. 1, 2, 1881.
10. Harrison, G. T.—The treatment of abortions. "Virginia Med. Monthly," Sept., 1881.
11. Richardson, W. L.—Manual dilatation of the os uteri as a means of inducing premature labor. "Trans. of the Am. Gynæc. Soc.," v, 1880.
12. Grassi, E.—Contribution à la connaissance du procès évolutif des tumeurs érectiles pendant la grossesse. "Ann. de Gynéc.," Sept., 1881.
13. Eve, J. A.—Occlusion of the gravid uterus. "Trans. of the Am. Gynæc. Soc.," v, 1880.
14. Clark, C. J.—Prolonged utero-gestation, with comments. "Coll. and Clin. Record," Sept., 1881.
15. Bell, C.—Extra-uterine conception. "Edinb. Med. Jour.," Oct., 1881.
16. Newcomb, G. H.—Extra-uterine fœtation; a case. "Med. Annals," Sept., 1881.
17. Rodriguez, J. M.—¿Qué ingerencia o participio tiene la matriz en la preñez extrauterina? "Gac. Méd. de Mexico," xvi, 18, 1881.
18. Leopold, G.—Experimentelle Untersuchungen über das Schicksal implantirter Föten. Ein Beitrag zur Physiologie der Extrauterinschwangerschaft. "Arch. f. Gynäk.," xviii, 1, 1881.
19. Litzmann, C.—Gastrotomie bei Tubenschwangerschaft, neun Monate nach dem Tode der ausgetragenen Frucht, mit vollständiger Entfernung des Fruchtsackes und glücklichem Ausgange für die Mutter. *Ibid.*
20. Werth.—Bericht über das anatomische Ergebniss einer Gastrotomie bei Extrauterinschwangerschaft nebst mikroskopischer Untersuchung des Fruchtsackes und Fötus. *Ibid.*
21. Engelmann, G. J.—Posture in labor. An ethnological study. "Trans. of the Am. Gynæc. Soc.," v, 1880.
22. Klikowitsch, S.—Ueber das Stickstoffoxydul als Anaestheticum bei Geburten. "Arch. f. Gynäk.," xviii, 1, 1881.
23. Chiara, D.—Un vecchio istrumento della pratica-ostetrica. "Giorn. Internaz. delle Sci. Med.," iii, 5, 1881.
24. Wilson, W. R.—Uterine fibroid complicating labor. What is the proper treatment? "N. Carolina Med. Jour.," Sept., 1881.
25. Garson.—On pelvic measurements. [Internat. Med. Congr.] "Brit. Med. Jour.," Oct. 1, 1881.
26. V. Hecker, C.—Ueber ein durch rechtsseitige chronische Coxitis in hohem Grade verengtes Becken. "Arch. f. Gynäk.," xviii, 1, 1881.
27. Glaister, J.—An unusual experience in placenta prævia. "Edinb. Med. Jour.," Oct., 1881.
28. ———.—Hémorrhagie par insertion vicieuse du placenta sur le col, au terme de la grossesse. Tamponnement. "Gaz. des Hôp.," Oct. 1, 1881.
29. Garnett, A. H.—Fatal termination of a case of labor. Was it from the sudden evacuation of the uterus, or from the too liberal use of fluid extract ergot (Squibb's)? "Cincinnati Lancet and Clinic," Oct. 1, 1881.
30. Mackintosh, E. Æ.—False aneurism of the labium (commonly called thrombus) following parturition. "Glasgow Med. Jour.," Oct., 1881.
31. Henning, B. G.—Thrombus or hæmatocele complicating labor. "Mississippi Valley Med. Monthly," Sept., 1881.

32. Kormann.—Ueber Ruptur eines grossen Haematoms der rechten grossen Schamlippe während der Eröffnungsperiode bei einer Zwölftgebärenden. "Memorabil.," xxvi, 6, 1881.

33. Dyhrenfurth, O.—Soll den Hebammen eine operative Hülfeleistung bei frischen Mittelfleischrissen gesetzlich gestattet sein? Antwort an Herrn Professor Valenta. "Arch. f. Gynäk.," xviii, 1, 1881.

34. Wendling.—Tetanus uteri puerperalis. "Wien. med. Presse," Sept. 11, 1881.

35. Howard, W. T.—Three fatal cases of rupture of the uterus, with laparotomy. "Trans. of the Am. Gynæc. Soc.," v, 1880.

36. Reynolds, H. J.—Puerperal eclampsia. "Detroit Lancet," Oct., 1881.

37. Staudinger, H. L.—Cases of puerperal eclampsia. "St. Louis Courier of Med.," Sept., 1881.

38. Parvin, T.—Secondary puerperal metrorrhagia. "Trans. of the Am. Gynæc. Soc.," v, 1880.

39. Coles, W.—The management of the breasts. "St. Louis Courier of Med.," Oct., 1881.

40. Fundenberg, G. B.—The prevention and treatment of mammary abscess. "Pittsburgh Med. Jour.," Oct., 1881.

41. Grammer, J.—Potassium bromide in orchitis and inflamed breasts. "Virginia Med. Monthly," Sept., 1881.

42. McFalls, D.—Puerperal fever; its specific character, pathology, and treatment. "Rocky Mountain Med. Rev.," Aug., 1881.

43. Maughs.—Puerperal fevers. [St. Louis Obstet. and Gynæc. Soc.] "St. Louis Courier of Med.," Oct., 1881.

44. Smith, A. H.—The relation of cleanliness to the prevention of puerperal septicæmia. "Med. News and Abstr.," Oct., 1881.

45. Felsenreich, A., u. Mikulicz, J.—Beiträge zur Kenntniss und chirurgischen Behandlung der puerperalen Pyohaemie mit Einschluss einiger progredienter nicht metastatischer Entzündungsprocesse im Puerperium. "Ztschr. f. Heilk.," ii, 2–3, 1881.

46. Burrage, R. L.—A case of acute pyæmia following labor. "Trans. of the Med. Soc. of New Jersey," 1881.

47. Erichsen, H.—Apnœa infantum. "Obstet. Gaz.," Sept., 1881.

1. Dr. Cohnstein believes that some women display a *periodical aptitude for impregnation;* that is to say, that they are most apt to conceive during some particular month of the year. He states that it is a very common thing for the birthdays of all the children of a family to fall in the same month. This is more generally the case in families in which the births occur at regular intervals of one, two, three, or more years, but is by no means uncommon in those in which the births are far between. The inference seems to be that in cases of sterility for which no physical cause can be ascertained the hope of ultimate fruitfulness should not be given up until several years have passed without the occurrence of conception.

3. In this letter Dr. Hicks renews his contention for *rhythmical uterine contractions as diagnostic of pregnancy*, but concedes the importance of certain observations by Dr. John Williams and Dr. E. Herman of somewhat similar contractions in soft fibroids. Even in such cases the uterine nature of the tumor must be conceded, he remarks, and amenorrhœa would establish the diagnosis of pregnancy. Such tumors as are referred to are not usually symmetrical, and hence would scarcely counterfeit normal pregnancy, and the relaxation is not so complete between the contractions as in pregnancy, in which latter case palpation of the fœtus settles the question. In mole pregnancies, however, with hæmorrhages, the symptoms would be very similar to those of the tumors mentioned, and further evidence should be accumulated to place the differentiation on a clear basis.

4. M. Broussin relates three cases of *retention of urine early in pregnancy.* [Only one of the cases was observed by himself. In that case a satisfactory examination early in its course was prevented by the great tenderness of the parts. It is by no means certain, therefore, that the retention was not due to retroversion of a gravid uterus, as it confessedly was in the two other cases. The author doubts it, however, and proceeds to construct a theory of its nervous or congestive origin.] The woman was fatigued, having been up several nights with a sick child; wherefore, he suggests, the pelvic organs, especially the neck of the bladder, already predisposed to congestion by the existence of pregnancy, rapidly became congested, causing a retention analogous to that which is observed in the subjects of prostatic disease as the consequence of fatigue or excess.

9. M. Marchal gives a *résumé* of the chief contributions that have been made to our knowledge of "*cervical pregnancy*," restricting the term to cases of arrested abortion, in which the ovum, retaining only a pedicle-like attachment to the body of the uterus, has been forced into the cervical cavity. The special indications for interference with a view to completing the abortion are: severe hæmorrhage, intractable vomiting, and signs of decomposition.

10. In this very judicious and instructive article on *the treatment of abortion* Dr. Harrison counsels a middle course between the practice of operative interference as an almost invariable rule—a course which he thinks professed gynæcologists are rather prone to adopt—and the equally hazardous routine that general practitioners are apt to fall back upon, that of temporizing in the presence of manifest danger. Supposing the os uteri to have closed, and the symptoms to indicate that the expulsion of the ovum has not yet been thoroughly accomplished, he advises anæsthetizing the patient, when it will generally be found easy to introduce the finger into the uterine cavity, and, with the aid of downward pressure upon the uterus with the external hand, the necessary manipulation for the removal of whatever may be shut up in the cavity of the organ will be a matter of little difficulty. He would reserve the use of the curette for exceptional cases, chiefly those in which there are adhesions.

15. Dr. Bell treats of *extra-uterine pregnancy* from both an historical and a practical point of view. [It seems amazing that, in the matter of treatment, he should say: "This must be entirely palliative, in many cases depending on the symptoms which arise," and then go on gravely to speak of castor-oil, Gregory's mixture, anodynes, sedatives, effervescent draughts, antacids, poultices, and the like. "The moment the abscess is matured," he says, "it should be opened, as in many instances it may contain the bones of the fœtus." In many instances the grave may "contain the bones" of the mother if extra-uterine pregnancy is to be treated according to the narrow lines laid down by the author, who seems indeed to know of no other perilous termination than that by abscess and the consequent exhaustion. To be sure he mentions that "Cæsarean section" has been suggested, and has been practiced with considerable success "on the Continent," but he hastens to throw cold water on such interference by remarking that, "so far as the children are concerned, the operation is not encouraging." It is possible that the author meant to limit his remarks to those cases in which the fœtus has died without the intervention of art, but neither in their title nor in any other way is there any intimation to that effect.]

19. Dr. Litzmann records a successful case of *laparotomy for extra-uterine pregnancy*. The gestation was of the tubal variety, and proceeded to term. The operation was undertaken nine months after the death of the fœtus, and was done with antiseptic precautions. The placenta appeared macerated, and the soft parts of the fœtus gave way easily under traction. The entire sac was removed, being only slightly adherent except by a pedicle-like attachment to the right broad ligament. This was tied in divisions with a catgut ligature, and its cut surface was cauterized with carbolic acid. The incision was dressed after the manner of Lister. The convalescence was interrupted by a mural abscess, which the author imputes to the silk sutures used in closing the incision. The case should teach us, he thinks, that it is not so extremely rare for a tubal pregnancy to advance to full term, and that we should take this possibility more into account in practice.

22. Dr. Klikowitsch treats of *nitrous oxide as an anæsthetic in midwifery* somewhat exhaustively, and thus enumerates its advantages: 1. Perfect freedom from danger to life for both mother and child, and no disturbance of the process of parturition. 2. Undoubted anodyne action in all stages of labor. 3. Unclouded consciousness during the highest degree of anæsthesia, obtained by mixing oxygen with the nitrous oxide, and the consequent possibility of enlisting the so-called forces of parturition. 4. Absence of vomiting, and in many cases the control of vomiting that has already set in; the non-occurrence of a stage of excitement and of the usual unpleasant sequelæ of anæsthesia. 5. The absence of any cumulative action. 6. The fact that the administration need not be carried on by the physician in person. The chief disadvantages are the costliness of the gas and its non-portability, comparatively speaking.

25. At the recent session of the International Medical Congress, Dr. Garson read a paper on *pelvic measurements*, with special relation to those most important in comparing pelves of different forms and those of different races. The diameter [which diameter?] of the brim, the form and width of the crests of the ilia, the height of the pelvis, the diameter of the outlet, and the form and length of the anterior and lateral parts were mentioned as the most important.

30. Dr. Mackintosh relates a case of *hæmatoma of the labium following parturition*, and states that he considers the term "thrombus," applied to such a tumor, as erroneous and misleading, for pathology has defined a thrombus, irrespective of its size, as a swelling within the vascular sheath. [The word "swelling" seems to us rather vague.]

40. Dr. Fundenberg admits that *inflammation of the breast* may be treated successfully by means of cold applications, as recently recommended by Dr. Hiram Corson, but for various reasons, which he mentions, he considers other measures preferable—especially the use of belladonna and pressure. Pressure is the prime factor, belladonna the auxiliary. Pressure may be made with adhesive strapping or with what is known among ladies as a "tight body," which is pinned as tightly over the breast as the patient can bear without positive pain. The latter has the disadvantage that it compresses both breasts, and that it must be unpinned every time the child is nursed, but it is not often needed longer than forty-eight hours, and so the objection does not amount to much. He applies a mixture of two drachms of extract of belladonna and half an ounce of glycerine over the entire gland. A soft double linen compress wrung out of warm water is then laid on, and over that a dry compress. The compression is then applied over all. Applied in the form of a plaster, an extract, or an ointment, belladonna, the author remarks, is comparatively worthless.

41. Dr. Grammer reports good results from the use of *bromide of potassium in inflammation of the breast*, given internally in doses of two grains every three hours during the day.

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4. M. De Sinéty presented an essay on the relations between *membranous dysmenorrhœa* and normal menstruation. Contrary to what he formerly supposed, and was still the general opinion, observations upon a great number of women had shown that the uterine mucous membrane was not cast off physiologically under the influence of menstruation. However, in certain pathological conditions it was exfoliated and expelled at the time of menstruation. This phenomenon did not constitute a special disease, a sort of morbid entity, but was observed in various states, with and without metritis. The exfoliation resulted from an exaggeration of the normal process, involving too intense an inflammation [*sic*] of the deep layers of the mucous membrane, and a compression of the vessels of that region, whence the shedding of the tissues situated above that layer. Thus it was that anything that hindered the escape of the blood from the surface of the mucous membrane, as was natural, might become a cause of membranous dysmenorrhœa. A histological examination of the shreds expelled was necessary to a precise diagnosis, and a prerequisite of rational treatment.

8. *Temporary expansion of the vagina*, which has been ascribed by Cohnstein and others to contraction of the muscular fibers in the pubo-vesico-uterine and utero-sacral ligaments, is declared by Pfannkuch to be a mere passive distension due to repletion of the vagina with some fluid, generally blood, the escape of which is impeded at the introitus. On examination, the following state of things is found: The finger, having passed the introitus, suddenly ceases to be in contact with the vaginal wall, but is perceived to have entered a great cavity constituted by the dilated vagina. The uterus is thus notably elevated, so that the cervix is to be reached only with difficulty if at all; the vaginal portion of the cervix is at the same time very much shortened, and the os externum gapes; the vaginal walls are felt to be smooth and tense, and the cavity is usually filled with coagulated blood. This mechanical distension of the vagina is favored by laxity of its tissue, an empty state of the pelvis, and diminished intra-abdominal pressure. Various circumstances may be the cause of the obstruction to the escape of the blood from the vagina; in one of the author's cases it was due to a matting together of the labial hairs with clotted blood, in another to a tampon, and in a third to spasmodic closure of the introitus. The author gives a warning against the hasty conclusion, in cases of post-partum hæmorrhage, that, because the outward flow has ceased and the uterus is felt to be well contracted, therefore the hæmorrhage has stopped; the vagina may even then be filling with blood, and may hold enough to amount to a serious drain in the case of a woman already anæmic. To be sure, the condition is not likely to arise immediately after delivery, but it has been met with in connection with consecutive hæmorrhage. [As regards the matter of spasmodic closure of the ostium vaginæ as a cause of distension, and of danger in the use of vaginal injections, the present writer would refer to some remarks by himself at a meeting of the New York Obstetrical Society, held January 4, 1881 (see the April number of this journal, p. 458). In view of the doubts expressed on that occasion as to whether there was any foundation in fact for such a theory, we take the liberty of translating Pfannkuch's account of his third case. "Very instructive," he says, "was the following observation. A lank, thin woman, twenty-four years old, passed through her first confinement normally ten months before. On the 24th of December, 1878, she was confined the second time—prematurely, at the end of the seventh month. The placenta came away of itself, and seemed perfect. The early part of the lying-in period was normal in its course, but on the 10th of January, 1879, bleeding took place again, and was severe at times. Among other measures resorted to to control it were repeated injections of hot water, with the addition of carbolic acid. Apparently the latter was imperfectly dissolved, and so a burning pain was induced at the introitus. On examination, January 16th, I found the woman moderately anæmic, and the uterus not to be felt externally; the entrance to the vagina was very tender

and contracted tightly about the finger; there were clots of blood in the vagina; the cervix was flabby and wide open; in the uterus there was a placental polypus as large as a pigeon's egg, which allowed of being separated with the finger-nail. After removing it I introduced my finger again, for the sake of exploration, and now found the vagina inflated like a balloon, and the uterus carried high up, by the retention of the blood that flowed during and shortly after the operation, and that could not escape externally during the spasmodic action of the constrictor cunni, which was still further irritated by the manipulation. By making firm backward pressure upon the perinæum with the finger, its escape was made possible, and the distended vaginal walls then fell together. I now washed out the vagina with a solution of carbolic acid, and in so doing was enabled to witness the renewed development of the same condition of things under my finger, for the contracted sphincter allowed no water to flow out. After I let it out by the manœuvre above mentioned the dilatation of the vagina at once disappeared again."]

14. Dr. Goodell thinks that the most common cause of *laceration of the cervix uteri* is too early rupture of the membranes, to which there is a great temptation to resort, as it undoubtedly hurries the labor through in a multipara. As a rule, it is best to wait until the os is dilated. In performing Emmet's operation he prefers the knife to the scissors for denuding. In drawing the uterus down, care should be taken not to make very powerful traction, as pelvic cellulitis might be caused. Of one hundred and twelve operations done by himself, only two have been followed by inflammation—both in hospital practice. Neither was fatal. In both the inflammation was peritoneal, and in one it was attributed to erysipelatous contagion, as a patient with erysipelas occupied the next bed. He never operates under the spray, but always bathes the parts with a one-to-forty solution of carbolic acid. He endeavors to remove all cicatricial tissue, and inserts the lower sutures first, as they offer the greatest difficulty. Other things being equal, the finer the wire the less likely it is to cut out. After passing each stitch the ends are brought together and a shot is slipped over them. Secondary hæmorrhage happened in one of his cases, but it was not at all alarming. In such a case it is best not to tampon the vagina if it can be avoided, as the accumulation of blood would interfere with the success of the operation, but rather inject hot water, followed, if necessary, by the injection of a hot solution of alum. The removal of the sutures is much facilitated by not cutting short those of them that are likely to offer any difficulty. To prevent the wire from sticking the vagina, a shot is clamped on its end.

25. Dr. Kocks describes and figures a nozzle that he has devised for the purpose of diminishing *the dangers of vaginal injections.* At its point the tube forms a loop, something like the eye-end of an enormous needle, and the openings for the escape of the water are all situated on the inner side of the lateral arms of the loop. Consequently no direct stream can enter the uterus. Even if the tube is inserted into the cervical canal, the walls of the cervix are held apart by it, so that free egress of water is secured. [The direct entrance of water into the uterus does not seem to us the sole source of danger, but there is the additional risk of its gaining entrance into the organ secondarily, or stretching pelvic exudations, by over-distention of the vagina consequent on spasmodic closure of the ostium vaginæ. This we have elsewhere insisted upon, and have published a description of a nozzle that overcomes that objection also (see the "Hospital Gazette" for October 15, 1877, also the "N. Y. Med. Jour." for April, 1881, p. 458).]

27. Dr. Erich relates several interesting cases of *pelvic abscess*, with special reference to the diagnosis between such formations and solid abdominal tumors. So great are the difficulties that he thinks it advisable to aspirate in all cases of doubtful abdominal tumor before pronouncing definitely upon its nature. After evacuating a pelvic abscess it should be kept constantly drained with a syphon drain, and washed out daily with an antiseptic solution.

28. Dr. Cecchcrelli thinks that *removal of the uterus by Corradi's method* will be found less objectionable than either Freund's or the vaginal operation, and to combine the advantages of the two. If necessary, the vagina is dilated a few days before the operation by means of water-bags. With the patient in Simon's posture, an incision is made through the linea alba large enough to allow of the hand being inserted into the peritoneal cavity. The water-bag is then removed from the vagina, and the cervix is brought into view with a Corradi's or a large Sims's speculum. The surgeon then introduces his left hand through the abdominal incision, and carries the tips of the index and middle fingers into the utero-vesical pouch; at the same time he presses upon the anterior fornix with the forefinger of the right hand, and is thus enabled to ascertain the exact limit between the uterus and the bladder. Through the middle of the fornix, grazing the uterus, he passes a needle armed with a strong silk ligature, one end of which is left hanging from the vagina, and the other from the abdominal wound. With the left hand the body of the uterus is now forced down into Douglas's pouch and outward; the vagina is then separated from the posterior (now become the anterior) aspect of the cervix with a knife, and, cutting close to the uterus all the time, the corresponding fold of the peritonæum is incised by a semilunar transverse cut reaching nearly from one utero-sacral ligament to the other. The body of the uterus is forced out through this incision, and is seized with two strong toothed forceps in the neighborhood of each Fallopian tube. The abdominal end of the ligature is brought down through the opening in Douglas's pouch between the two forceps, thus forming a loop around the uterus in the median line. To one end of this ligature is attached the end of a platinum wire 1 mm. in diameter; by drawing on the other end of the silk ligature the wire is then made to take the place of the silk loop, and its two ends are fastened to a *porte-anse.* The operator then withdraws his left hand from the abdomen, perfects the adjustment of the platinum loop, makes it tense, and brings it to incandescence with a battery. He thus bisects the uterus in its median line. If the organ has been sufficiently retroverted and flexed, and sufficiently forced downward and outward to arrest its circulation, and if the cautery has been managed properly, there will be no hæmorrhage; should bleeding take place, it is easily controlled by throwing a provisional ligature around each half of the uterus. The hæmorrhage can, indeed, be controlled so readily that the division of the organ may be done with the écraseur or the scissors, but the galvanic loop is preferable. The two halves of the divided uterus are drawn away from each other with the forceps—one to the right, the other to the left. The left index finger is now placed in the left anterior peritoneal fold, and, cutting upon it as a guide, the left half of the anterior fornix and the corresponding peritoneal fold are separated from the cervix with a probe-pointed knife or with scissors. This manœuvre having been repeated on the opposite side, the uterus is now attached only by its ligaments. By this method it is very easy to avoid injuring the bladder and the ureters. In ligating the ligaments, and in removing the ovaries, if the latter is thought necessary, the utmost facility will have been gained by the division of the uterus into two parts, each of which may be twisted around so as to present its cut surface externally and its attachment internally. Each ovary may then be seized and removed after proper ligation; precautionary ligatures may be thrown around the tube, the round ligament, and the utero-sacral ligament; finally, the tube and the round ligament may be seized with forceps and lifted up to display the broad ligament, which should be transfixed with a needle carrying a strong double silk ligature, the upper thread of which is made to encircle the tube and the round ligament, and the other the utero-sacral ligament near its uterine attachment. These procedures having been done on both sides, the two halves of the uterus, held wide apart all the time, are drawn forcibly outward, and the lips of the transverse vaginal wound are brought together with sutures. Each half of the uterus is then removed, cutting the tissues close to the ligatures, and leaving the stumps of the ligaments, together with the ligatures, hanging down from the angles of the vaginal suture. After cleansing the vagina, the abdominal incision is closed with sutures. Corradi has devised several special instruments to be used in this operation, the most notable of which is a sort of fan or diaphragm intended to support and protect the abdominal organs during its execution. It admits of being so folded as to pass readily through the small incision, and its handle does not obstruct the field.

29. Olshausen's article on *removal of the uterus* is founded on ten cases of his own, and on the experience recorded by others, and deals chiefly with the indications for the operation, with the relative advantages of the abdominal and the vaginal methods, with the question of drainage of the peritoneal cavity, and with certain technical details. As regards the abdominal method, he calls attention to the frequency with which the ureters have been wounded or included in a ligature, and refutes Fränkel's assertion, that one would never have to leave this operation unfinished, with the remark that four incomplete operations are already on record, including one by Freund himself. Of the proposed improvements in the technics of the operation, only the following seem to him to be of much importance: (1) The control of hæmorrhage by means of separate ligation of the uterine artery, as recommended by Rydygier and Billroth, and ligation of the lower part of the broad ligament in three or four divisions, according to Bardenheuer. (2) The mitigation of shock by Bardenheuer's method of sustaining the warmth of the body with hot sand and vessels of warm water; although it is hardly likely that it will succeed in the majority of cases, even if aided by the same author's more recent device of spreading a sort of apron over the pelvic entrance. (3) Breisky's idea, carried out by Rydygier, Bardenheuer, and others, of lessening the danger of injury to neighboring organs by first cutting through the vaginal wall from below—the most valuable improvement upon the original method; also Kocks's suggestion (which, so far as the author knows, is not carried out by any one) to complete the separation of the uterus in front and behind before tying the broad ligaments, thus lessening the risk of injuring the ureters and making the arrest of hæmorrhage easier and surer. (4) Drainage of the peritoneal cavity to diminish the danger of septicæmia. In regard to this, however thoroughly we may hold to Lister's principles, the anatomical differences between the peritoneal cavity and other surgical regions are such that we can not here carry them out so unerringly as elsewhere. Drainage through the vagina, however necessary it may be under certain circumstances, can never afford such security against the access of infective matter as drainage at the surface of the trunk or of the limbs affords. In removal of the uterus the vagina always has to be opened, so that absolute asepsis during the operation is impossible. Theoretically, there is this advantage in the abdominal method, that it enables us to cleanse the peritoneal cavity more thoroughly after the operation, and to establish a more efficient drainage; but this is more than counterbalanced by the shock and by the much greater likelihood of infection taking place during the operation. Experience does not show that Bardenheuer's method wholly does away with the danger of septicæmia.

Of the author's ten cases, in four the abdominal operation was performed (with three deaths and one survival), and in six, the notes of which are given, the vaginal (with no deaths). Of forty-one cases of the vaginal operation tabulated by the author, twenty-nine ended in recovery, and twelve in death. As regards the comparative merits of the two methods, the vaginal operation produces but little shock, greatly diminishes the danger of injuring the bladder and the ureters, lessens the liability to septicæmia, allows of more thorough drainage, is easier and simpler of execution, and is followed by more rapid and satisfactory convalescence. The only possible advantage of the abdominal method is that it allows of the removal of diseased lumbar glands, that may sometimes be necessary. Secondary deposits in the broad ligaments are more readily removed from below. In exceptional cases, however, the abdominal operation is legitimate, as when cancer of the uterus is complicated with myomata or other enlargements of the corpus uteri, or when the vagina is unusually narrow, or when there are uterine adhesions not of a nature to contraindicate the removal of the organ.

As regards the technics. The neoplasm should be thoroughly disinfected before the operation is begun. Simple irrigation is not enough, but its whole surface should be rubbed vigorously with a cotton wad while a five-per-cent. solution of carbolic acid is flowing over it. If there are abundant soft outgrowths they had better be removed with the sharp scoop. After cutting around the neoplasm, as far away from it as practicable, any blood-vessels of the vaginal wall that bleed profusely should be tied. This is facilitated by passing a long ligature of the stoutest silk through the anterior and posterior portions, by which they may be drawn down and inspected at any time. If the neoplasm has not invaded the wall of the bladder, this organ may easily be separated from the uterus by mere pressure with two fingers from below. The presence of a catheter in the bladder is not necessary as a guide. In like manner the separation of the tissues at the side of the cervix is effected, up to the region of the os internum, allowing of exploration of the parametria and the removal of any portion of the neoplasm that may be found in them, as well as so increasing the mobility of the uterus as to facilitate the application of the ligatures. Differing with Billroth, the author advises seizing the upper portion of the uterus with a Muzeux's forceps introduced high into Douglas's space, and turning it over, although this may sometimes be very difficult. It is better that the teeth of the forceps should be somewhat blunt; they hold just as well, and are less liable to tear out and wound the operator's hands or the rectum. In certain cases, especially if the body of the uterus is of moderate size, it may be easier to bring the organ down anteriorly than posteriorly. The broad ligaments are best tied with soft iron wire introduced through a curved cannula. Slipping may be prevented by carefully watching the *serre-nœud*, and still greater security is attained by slipping a silk ligature around to the outer side of the wire, which will of itself slip into the groove already made by the wire. Care must be taken to cut the broad ligament at a sufficient distance from the ligature. After completing the excision of the organ the wound in Douglas's pouch is left open, the vaginal walls are replaced, and a drainage tube as large as one's thumb, perforated only at its upper part, is carried up about six centimetres into Douglas's space, and is retained there by a short transverse piece of tubing at its upper end. Free irrigation with a two-and-a-half-per-cent. solution of carbolic acid is practiced through the drainage tube after the operation is finished. The drainage tube must not be left in place too long, for its pressure is very apt to cause gangrene of the intestines.

Removal of the uterus is justified only by malignant growths (carcinoma or sarcoma), and then only when there is a good prospect of being able to remove all the diseased tissue. If fixation of the uterus takes place after the appearance of the neoplasm, it is to extension of the latter that it is due, and not to ordinary inflammatory action; hence the operation is contraindicated. It may be allowable in some cases of total prolapse of the uterus in which all other measures fail.

QUARTERLY REPORT ON GENERAL MEDICINE.*

No. VIII.

By W. H. KATZENBACH, M. D.,
ATTENDING PHYSICIAN FOR DISEASES OF THE CHEST TO THE OUT-DOOR DEPARTMENT OF BELLEVUE HOSPITAL.

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5. M. Laveran believes that he has found *a new parasite in the blood in malarial fever* in twenty-six out of forty-four cases. It presents itself under three different forms, which he thinks are the three stages of its development. [He gives drawings of the parasite.] It has not been found by him in the blood of any other than malarial-fever patients, and disappears under the prolonged administration of sulphate of quinine.

15. In ten years' hospital experience of *acute and subacute rheumatism*, Dr. Carter met with four hundred and thirty-one cases, of which ten proved fatal, a mortality of two and three tenths per cent., the deaths occurring chiefly in cases with very high temperature. As to treatment: for hyperpyrexia he believes that baths are the only thing from which good results can be expected. The temperature of the water at the beginning should be 90° F., reduced to 80° or 75° in twenty-five to forty-five minutes. He believes that a body temperature of 105° is dangerous, and an indication for the employment of the bath. Where more or less periodicity is present, he believes malaria to complicate the disease, and gives quinine with other remedies. If the pains are markedly worse at night, and there is any suspicion of syphilis, he gives iodide of potassium. Blisters were found to be efficacious in relieving pain and tension in the joints. He believes thoroughly in salicylic acid, or the salicylate of sodium, their most decided effects being shown in acute uncomplicated cases; and he gives them in large and frequently repeated doses. He found that in eight per cent. of his cases they failed to give relief. In one hundred and seventeen cases he has never seen any delirium or great cardiac depression result from their use, except in four doubtful cases. Hydrobromic acid and salicylic acid constitute a good combination. Salicylic acid has great influence in warding off cardiac complications. After administering the acid for some time it was found that it took from forty-eight to seventy-two hour before all trace of it disappeared from the urine, and he advises its administration three or four times a day for a few days after the patient begins to move about, with tincture of the chloride of iron night and morning.

17. Dr. Duckworth draws attention to *disturbances of sleep in the gouty.* The simplest form of insomnia is due to dyspepsia, and often to certain articles of diet, the patient being awakened about four or five hours after the ingestion of food, the time when attacks of gout are prone to come on. Unless relieved he will lie awake, with throbbing and an active flow of thoughts, for an hour or two, when sleep will return, and he will get up in the morning probably with headache and anorexia. Other forms of gouty trouble manifest themselves not uncommonly in the early morning hours, as attacks of bronchitis with asthmatic dyspnœa. Bad dreams may awaken the patient; startings and shoutings; severe priapism without erotic feelings; grinding of the teeth; somnambulism; cramps in the calves of the legs—these may occur when the subject of them is in a very gouty condition, or as precursors of overt outbursts of gout.

19. As the *nervous symptoms of lithæmia*, Dr. Da Costa enumerates vertigo, headache, neuralgia, cramps in the legs, muscular twitchings, pains and perverted sensations, anæsthesia, sleeplessness, undue sensitiveness to sounds and odors, nervousness, reflex pains and aches, mental depression, and loss of memory. The lithæmic vertigo is a giddiness frequently repeated; comes irrespective of exertion, though long-continued fatigue and mental worry excite it; it is objective, things seeming to turn around the patient; there is generally no loss of consciousness; it may come on without warning, or be preceded by a sense of emptiness of the head, specks floating before the eyes, or dimness of sight; for the most part there is absence of all gastric symptoms; and if often repeated for a long time it will give rise to indistinctness of vision, organic changes in the eye, and slight impairment of hearing. In some cases there is a momentary suspension of consciousness. Headache is generally not persistent, but of acute, periodical, neuralgic type. Neuralgia is common, and may attack any nerve in the body that is capable of aching, but the one most infrequently attacked is the fifth. Gastralgia is very common, and apt to alternate with other neuralgias. Cramps in the legs are apt to come on at night, and particularly affect the gastrocnemii muscles. They are more frequent in winter. One of the most singular of the perverted sensations is that of great fullness and rather pleasant warmth in one leg from the knee down. Anæsthesia is not common, generally localized, and consists of a feeling of numbness or pricking. Great irritability of temper is often present. These symptoms are very interchangeable, and though mostly occurring without very marked gastric or hepatic disorders, still more or less of these latter phenomena are present. Most of them are relieved when a large amount of lithates are discharged in the urine, or free purgation takes place. As to treatment, treat the state, and not the nervous symptoms themselves, by means of diet, forbidding the use of beef, mutton, butter, cream, fat, sugar, and alcoholic spirits; potatoes may be eaten in moderation, as well as eggs. Exercise, friction to the skin, etc., and natural saline waters are useful. Citrate of lithium is of benefit. For nervous symptoms, zinc and arsenic, and for sleeplessness one of the bromides may be given.

20. *Senile osteomalacia* is, according to M. Demange, identical with that of adults less advanced in life, so far as its pathological anatomy is concerned, but differs from it in being limited to the thorax, vertebral column, and pelvis, never attacking the limbs; while the other form of the disease is, as a rule, general, though sometimes it may be localized. It begins with pain in the vertebral column, ribs, and sternum, as a rule; then pain is complained of in the pelvis, and at times in the lower extremities; these being often mistaken for neuralgic or rheumatic pains, and continuing a long time before the characteristic deformities show themselves. Like the pains, the deformities tend to localize themselves at certain points, and are as follows: Flattening of the vertebræ, crushing in of the chest, with forward projection of the sternum, which seems as if bent in two, so that often the chest sinks forward till its inferior border rests on the pelvis. General feebleness, nervousness, muscular contractions, multiple fractures, colliquative diarrhœa, marasmus, and death complete the history.

21. M. Morvan reports fifteen cases of *myxœdema*, from the study of which he reaches conclusions not entirely in accord with the opinions of others. He says that the anasarca, though always marked, is never extreme, and that the amount of it varies with the temperature, being more pronounced in winter than in summer. In his cases it was exceptional for œdema to appear to any extent in the mucous membranes, and he regards the roughness of the voice and the constipation occurring in the disease as due to paralysis of the nerves supplying the larynx and the muscles of the intestine, rather than to œdema. The complexion of his patients was generally good, and he has not noticed any change in regard to the skin. Speech is slow, the movements of the tongue are embarrassed, and the voice is rough. The patients walk with difficulty, and are unable to run; the upper extremities are feeble, and the fingers lose their dexterity, especially if the hands are put into cold water, when they can neither be opened nor shut completely; and these symptoms he believes to be paralytic. Sensation remains intact. On the part of the brain, vertigo, somnolence, delirium, and hallucinations were met with. The patients complain of cold. The course of the disease is slow, and its duration considerable. As to etiology, almost all the cases occur in the female sex; mostly in adults in middle life; in no case was a woman attacked before menstruation had appeared, but it has occurred in men; in nine out of fourteen cases it appeared at the menopause; it is possible that rapidly-recurring pregnancies may be an exciting cause as well as prolonged lactation; it may be hereditary, or due to nervous impressions; it attacked the peasant class most frequently. A humid climate probably predisposes to it, and it appears most often in winter. The disease is a neurosis of the central nervous system, affecting the afferent portion of the motor nerves, both of animal and organic life, they becoming paralyzed.

26. This excellent article on *the symptomatology of primary, immediate, or direct hæmorrhage into the ventricles of the brain* is so full and long that the limits of this abstract do not allow of more than a synopsis of its headings. The premonitory symptoms of such hæmorrhage are not distinctive; they may precede the attack for a variable period, and are by no means always present. The most common is cephalalgia, which may be of any variety. Next comes dizziness or giddiness; shivering or chilliness; drowsiness; heaviness of the head; slight deafness; malaise; indescribable sensations about the head; sensitiveness of one cheek; nausea; muscular weakness; numbness; cramps; symptoms of passive congestion; these may all be grouped or occur singly, the rule being the latter. At the time of the attack death is speedy, preceded by convulsions, paralysis without loss of consciousness, in some aphasia, paralysis with partial or complete loss of consciousness (one of the most frequent modes of onset), or partial or complete loss of consciousness without paralysis. In the two latter classes death is delayed several days. The symptoms of the disease are: 1. Deranged intellectual action, as confusion of mind, an early symptom; delirium, usually of a quiet, muttering kind; drowsiness, rare; stupor, more frequent; collapse without reaction; unconsciousness, probably due to the nerve cells receiving a blow which temporarily or permanently deprives them of their functional power. 2. Motor disturbances: Contracture, may be trismus alone; contracture of one upper extremity, or of both; trismus and contracture of both upper extremities; contracture of the extremities of one side, or of all the extremities, the latter in the greatest number of cases. Contracture may appear immediately, or be delayed; and may be transitory, intermitting, persistent, or interrupted. Though important, it is not characteristic or pathognomonic of this disease. Convulsions, one of the most important and frequent symptoms, are more or less general, in most cases early, of all grades; complete coma usually exists with them, and they may alternate with contractures. Paralysis is frequent, and does not differ from that due to ordinary interstitial encephalic extravasation. 3. Disturbances of sensation: Sensibility may remain perfect, even though unconsciousness be complete, or there may be anæsthesia. Reflex action is generally preserved, though weakened. 4. Disturbances of the organs of special sense: Sometimes a buzzing in the ears is complained of. The pupils are most often equally contracted, but may both be equally dilated, or one dilated and the other contracted, the degree of either contraction or dilatation varying. In some cases there is insensibility to light, or strabismus. Speech may be partly or completely lost. 5. Disturbances of the alimentary canal: Frothing at the mouth is comparatively frequent, and there is deviation in some cases. In one out of three cases in which the point was noted the tongue deviated on protrusion. Deglutition is generally easy. Nausea and vomiting are quite frequent, usually occurring early, either slight or persistent; may be cerebral in character. Constipation is the rule. 6. Disturbances of circulation: The pulse is not characteristic; usually at first it is slow, full, strong, and regular, afterward rapid and weak, then irregular and intermittent, and finally imperceptible. 7. Disturbances of respiration: Generally there is stertorous breathing, varying in degree; it may be irregular, rapid, or slow. 8. The temperature may be above or below normal. 9. Urine: There may be retention or involuntary discharge. 10. Surface symptoms: The countenance is usually dull and apathetic; if pale in the early stage, it is a bad omen. It may be red, congested. Coldness of hands or feet, or entire body, often observed, is not a symptom of so bad import as paleness. Sweating may be present. 11. Apparent improvement takes place in many cases, followed by the most aggravated symptoms and death.

32. *Allochiria* is the name given by Dr. Obersteiner to a peculiar sensory disorder consisting in the fact that, though the sensibility is retained more or less completely, the patient is either not clear or is in error as to which side of the body has been touched, the irritation being commonly referred to the corresponding part of the other limb. This symptom, excepting in one case of hysteria, was noted only in diseases of the spinal cord, mostly in tabes dorsalis. Degeneration of the posterior columns of the cord is probably the cause of the disorder.

33. This is a digest of two hundred cases of *chorea*, from which the following facts are noted: Females were affected more than males in the proportion of two, three, or four of the former to one of the latter. The greatest number of cases occurrėd between the ages of six and eleven, the next most frequent period being between eleven and fifteen. As to season, winter and spring were the most prolific, and, taking the year through, nearly two and a half times as many cases occurred during the first six months of the year as during the last six months. In thirty-one cases relapses were noted, and of these the date was noted in nineteen cases, fourteen in the first six months of the year. Among etiological factors, rheumatism was noted in forty-two cases. Other factors were cardiac trouble, the puerperal condition, psychical influences, and fright (seven cases). In thirteen cases speech was affected, in the majority (ten cases) associated with choreic movements of the right side. In sixty-six cases in which the seat of motion was noted, it was limited to, or predominated on, the right side in fifty, the left side in sixteen.

48. Dr. Buzzard draws attention to the prominence given by both Romberg and Duchenne to the incoördination of movement often observed in *locomotor ataxia*. Hence the symptom (which is very frequently absent) has come to be regarded as essential. The author accepts Westphal's symptom (the absence of the knee-phenomenon), along with good voluntary power in the anterior muscles of the thigh, as almost positive evidence of the existence of tabes dorsalis when it is associated with any one or more of the recognized symptoms. He relates five cases in which the *crises gastriques* were so strongly marked as to monopolize attention, which would hardly have happened had the symptoms from which Duchenne named the disease been present. In one of these the author found absence of knee-phenomenon, pupils small, contracting in accommodation, but not to light, and lightning pains, along with the gastric crisis; but this latter symptom was so predominant that the case was pronounced by others to be one of cancer of the stomach, notwithstanding the gastric symptoms had existed paroxysmally for fifteen years. In another case correctly diagnosticated as tabes dorsalis there was a history of obstinate vomiting and epigastric pain of at least three months' duration. Many cases of so-called gout in the stomach may probably be examples of the gastric crises of tabes, as well as some supposed to be due to intestinal obstruction. A like prominence of some other symptoms of tabes may equally absorb attention. Pierret's view, that the disease is essentially a chronic inflammation of sensory fibers, is adopted, and it is urged that, just as optic atrophy may be the dominating symptom in some cases, so atrophy of the auditory nerve may be the prominent one in others, and thus many cases of so-called nervous deafness may be examples of tabes dorsalis. In one case stone in the bladder was the first symptom of tabes dorsalis. The bladder trouble may be more than usually pronounced, and lead to retention of urine and accumulation of mucus, in which a phosphatic calculus is formed.

55. Dr. Powell referred briefly to eight cases in which he had taken the opportunity of ascertaining the presence or absence of *Baccelli's test of the character of pleuritic effusions—aphonic pectoriloquy*—immediately before the withdrawal of fluid from the chest. The conclusion was to the effect that, although of considerable value in association with other signs, yet it was by no means pathognomonic. Baccelli maintained that if, in a case of pleuritic effusion, the whispered voice was well conducted and pectoriloquous in character when listened to through the thickness of the fluid, that fluid might certainly be regarded as serous; but, on the contrary, if the whispered voice was ill conducted or inaudible, the fluid would be found to be purulent.

62. This is an elaborate study of *the frequency of pulse and respiration in tuberculosis of the lungs.* Dr. Biach found that sex and age had no influence upon the frequency of pulse and respiration. The most rapid pulse found in one hundred cases was 174, the slowest 48; the most rapid respiration was 76, the slowest 12. The most frequent maxima of pulse were 120 and 132; the most frequent minima, 84, 96, and 72. The most frequent maxima of respiration found were 48 and 36; the most frequent minima 20 and 24. In the subacute forms of the disease, for the most part, the extreme maxima of the pulse and respiration were reached, while the above-mentioned pulse and respiration minima were found in the more chronic forms. There was a certain relation between temperature and pulse; the higher the one the faster the other, though sometimes the same pulse rate was found with the opposite extremes of temperature, or the lowest temperature accompanied a faster pulse rate than the highest. Between temperature and respiration there was no certain relationship, and the same held good between the frequency of the pulse and that of the respiration. Ninety-six strokes to the minute was the pulse most frequently found; then came 120, 108, 84, 100, 132, 104, and 112. The higher rates of pulse were found most frequently in the evening, but in some cases the morning gave the fastest pulse. The character of the tubercular affection, whether subacute or chronic, did not influence the pulse rate. Thirty-six respirations to the minute was that most frequently found, then 24, 28, and 32; and the form of the disease did not influence the rate of respirations to any extent. The most rapid respirations were found in the evening. In some cases in which pneumothorax appeared the pulse rate increased. The occurrence of peritonitis, pleuritis, grave alterations in the larynx, etc., increased the rate of respiration, but had no marked effect on the pulse.

63. In this article *the etiology of miliary tuberculosis* is treated of under three heads, viz.: 1. Evidence that it is communicable from one human being to another. 2. That it is communicable from man to animals, and from animal to animal. 3. Regarding the nature of the materies morbi. Under the first head, the author says that tuberculosis may be inherited, not only in the sense of an hereditary predisposition thereto, but the absolute materies morbi. It may be acquired, as where the husband takes it from the wife, or *vice versa* (cases given), or a patient from an attendant (cases); in these the materies morbi most often gaining access through the medium of the respiratory tract. Under the second head he quotes the experiments of Cohnheim and Salomonsen in producing general miliary tuberculosis in animals by inoculating the eye with human tubercular matter. The period of incubation—i. e., the time from the introduction of the virus into the eye to the first crop of gray tubercles appearing in the iris—was three weeks. Further, it has been shown that gray miliary tubercles have been produced in the iris of the rabbit and the guinea-pig from human tubercle and nothing else. The tubercular virus seems to exist in the blood of rabbits that have died of tuberculosis. Tuberculosis may also be transmitted by feeding (cases), the milk and meat of tuberculous animals being capable of conveying it. The nature of the materies morbi is still unsettled.

70. Professor von Stoffella holds that *fatty heart* is due to destruction of the albumen of its muscular fibers, consequent upon deficiency of oxygen in the system, and that it is not so absolutely fatal as it is generally considered. He recommends most strongly in such cases large doses of iron continued for months, not as a palliative, but as a medicine which is capable of directly overcoming the fatty degeneration of the heart muscle. As to dietetic measures, he recommends that a certain proportion of fat, carbo-hydrates, and lime be allowed, with a liberal supply of meat.

83. Dr. Wade makes a distinction between *dilatation of the stomach* and distention. By the latter he means a condition in which the stomach, if emptied, returns to a normal size; by the former, a condition in which the stomach, if emptied, does not do so. Dilatation may be acute; may depend on pyloric obstruction from thickening or growths of, or within, the stomach or pylorus; or from the pressure of external tumors; there may be what he names "intrinsic chronic dilatation," cases in which we do not find, after death, any physical or mechanical cause to explain the non-escape of food from the stomach, and yet it is enlarged, and its walls are either hypertrophied or atrophied. To explain this latter condition, he suggests that the dilatation may be the effect of many attacks of acute distention due to gastric catarrh, a tenacious mucus possibly plugging up the pylorus, or a prolonged tonic contraction of the sphincter muscle taking place on account of undue irritation by the acid contents of the stomach. The main point in the diagnosis of dilatation of the stomach is the vomiting, which is infrequent, preceded by a feeling of painful distention, oppression, or uneasiness, and followed by speedy and great relief, the ejecta being commonly yeasty in appearance, inodorous or sour-smelling. Physical examination reveals the existence of a large splashing cavity, the lower border often at or below the umbilicus.

QUARTERLY REPORT ON MATERIA MEDICA, THERAPEUTICS, AND TOXICOLOGY.

No. VII.

By GASPAR GRISWOLD, M. D.

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5. M. Simon gives the following practical points upon the subject of *sea-bathing for children:* 1. Do not send them to seaside resorts except at seasons which are not apt to be stormy, and even then insist upon the parents taking

with them a supply of warm clothing, which may be required by the children on cold evenings and mornings. 2. Do nothing heroic until the child has become thoroughly acclimated, allowing for this five or six days; during this time do not let the child exercise too much, and do not allow it to commence bathing. 3. The first bath, taken when the child is feeling well and inclined to it, should not last longer than a minute; succeeding ones should not last longer than five minutes. It is a good precaution in suitable cases to allow an interval of forty-eight hours between the baths for the first few times. 4. If after a time, having taken a number of baths, the child does not improve, do not persist in the treatment from theoretical considerations, but be influenced by clinical observation, and suspend the bathing temporarily, or stop it entirely. In the case of very rachitic and other feeble children it may be well to begin with tepid baths. 5. In bilious temperaments, with a decided tendency to constipation, headache and restlessness at night are apt to be caused by sea-bathing. Attention to the condition of the bowels, and the occasional administration of rhubarb or magnesia, will obviate these unpleasant symptoms, and the bathing will then be attended with benefit. 6. Children with joint diseases of the upper extremities may be allowed to bathe without splints or appliances, but these are advisable where the disease is situated in the lower extremities or spinal column, since children are apt to make unusual exertions under the excitement of entering the water. 7. As a rule, pulmonary troubles are not benefited by sea-bathing; it is in the case of strumous subjects with glandular enlargements, and in rachitics, that the best results are obtained. 8. The author mentions that in some cases the sea-bathing and salt air seem to excite the little patients to an undesirable extent; he has observed this most conspicuously in girls of from eight to twelve, and believes that this over-stimulation of the nervous system may in susceptible individuals be the cause of an hysterical diathesis developing subsequently.

7. Dr. Rabow discusses *the so-called dosimetric system of therapeutics* as follows: The founder of the system is Dr. Burggraeve, who has brought a great deal of ability and enthusiasm to bear upon the formulation of its tenets. His assistant in the work has been the apothecary, Chanteaud, of Paris; their scholars and stanch adherents are to be found now in every state in Europe, and it is their firm conviction that the dosimetric system is the great advance of the century in therapeutics. They look upon the ordinary pharmacy, stored with bulky and inefficient drugs, as an absurdity, and consider the so-called expectant treatment as irrational and mistaken. One idea was always foremost in the mind of Burggraeve, and that was a quick and determined struggle with disease through the agency of effective remedies. Such remedies he conceived the active alkaloids to be, and a system of medicine embodying his views he believes he has erected in dosimetry. The alkaloids are employed in the form of granules of ½ to 1 milligramme, repeated at short intervals. All diseases are divided into two periods, viz.: 1. The vital, or dynamic, comprising the onset of the disease, before any organic changes have taken place. 2. The organic period, after organic lesions and tissue changes have resulted. Dosimetry directs its most heroic and determined attack upon the first, or vital period, endeavoring by the free use of powerful alkaloids to suppress the abnormal processes before they have succeeded in producing tissue-modification. Since disease is treated before organic lesion has occurred, it is obvious that symptoms, such as pain, cough, etc., rank first in importance, and physical examination or definite diagnosis is out of the question. Temperature is much considered, and the thermometer is frequently employed. The tenets of dosimetry may be formulated as follows: 1. All acute diseases (including intermittent, remittent, and continuous fevers) must be conquered in their very inception. 2. In the treatment of all diseases two elements are to be recognized, the *dominant* and the *varying*. The first consists in the direction of a specific treatment to the suppression of the fundamental cause of the disease; the second is palliative, and has in view the amelioration of symptoms as they present themselves. 3. Acute treatment for acute affections, gradual progressive treatment for chronic diseases. 4. Treatment must have special reference to dynamic and vital processes, since it is against these that our remedies are most effective. 5. For treatment only simple, powerful, mathe-

matically-dosed remedies, the alkaloids, should be employed. The dosimetric medicines, best obtained from Chanteaud, at Paris, are as follows: Granules, ½ milligramme each, of aconitia, hyoscyamia, atropia, strychnia, etc.; granules, 1 milligramme each, of arsenious acid, digitalin, apomorphin, bryomin, elaterin, etc.; granules, 1 centigramme each, of salicylic acid, podophyllin, santonin, ergotin, monobromated camphor, etc. Beyond this a salt of Seidlitz, prepared by Chanteaud, plays an important part in the treatment; with daily doses of this the intestines are kept washed out so that fæcal accumulations may not interfere with the absorption of the alkaloids. In all febrile diseases the dosimetric physician uses in succession, in the order of their efficiency, the following: Veratrin, digitalin, aconitin, colchicin, chinin, etc. A granule is given every quarter or half hour, no matter what the cause of the fever may be, "until the physician is master of the fever." No maximum limit of doses is recognized. [Dr. Burggraeve's account of his own experience in Madrid is a curious comment upon the treatment which he advocates; his story runs as follows: "Although I had been in Madrid before, and therefore was half acclimatized, yet I should no doubt have been ill had I not been wise enough to take every morning a dessertspoonful of Seidlitz (Chanteaud); during the day three or four granules of quassin; and in the evening at bedtime four granules of strychnin, four granules of aconitin, and four granules of digitalin. In this way I preserved my physiological equilibrium." This seems pretty active treatment for a healthy man to subject himself to as a result of purely theoretical apprehensions.]

8. A paper on *the action and uses of antipyretic medicines*, by Professor Fokker, may be summed up as follows: While it is easy to understand the efficacy of simple refrigeration in the treatment of pyrexia, the mode of action of antipyretic remedies administered internally is still obscure. We must assume, either that they lower the temperature by interfering with the circulation, or that they exert a destructive action, by virtue of their antiseptic properties, on the low organisms to which the pyrexial phenomena are presumably due. The second of these hypotheses is the more likely one. It may, of course, be objected that such remedies can never be administered in sufficient quantities to insure their presence in the blood in sufficient proportion to render it aseptic, or, at any rate, to exercise an antiseptic influence. It must not be forgotten that any hostile factor, though unable of itself to check the multiplication of germs, may succeed in doing so when combined with others equally hostile to bacterial life. It is quite possible, moreover, that antipyretic medicines may accumulate in particular organs, which may then exert a disinfectant influence upon the blood. Antipyretic remedies may legitimately be given in febrile maladies, when the heat of the body is such as to threaten the patient's life, or even the integrity of the tissues. Under these circumstances, those aromatic substances which are at the same time bacterial poisons should be preferred to physical means of refrigeration. But, when the temperature of the body does not rise to a dangerous height, the employment of such remedies in antipyretic doses is undesirable; since a degree of heat only a little above the normal temperature of the body is injurious to the vitality or the virulence of the pathogenic organisms. It is quite possible, indeed, that the febrile heat may be one way in which the system reacts against these organisms, and tends toward recovery. In all cases, therefore, where the temperature does not rise so high as to be itself a source of danger, physical refrigeration should be avoided, and the antipyretic remedies should only be prescribed in relatively small doses. [How simple and plausible this sounds! "Do not resort to physical refrigeration, but give those antizymotic remedies which lower temperature by destroying the bacterial organisms which cause it, and not by interfering with the circulation!" Not a word about the undesirable effects of these antizymotics; not an allusion to the fact that they do not affect temperature appreciably unless given in doses which produce almost toxic effects! One would think that these much-praised agents quietly killed off the germs, and gently relieved the patient of his fever, without disturbing him in any way. But every practicing physician knows that quinine will not depress temperature unless given in twenty- or thirty-grain doses. And it is equally familiar that quinine in such doses disorders the stomach, not infrequently causing vomiting and purging, and that

at a time when the greatest efforts are being made to keep up nutrition; the heart's action is depressed, and the nervous system so powerfully affected that reflex is almost paralyzed; the patient lies almost in stupor, scarcely able to hear or see. Certainly this does not look as if the influence of the antipyretic agent was exerted exclusively upon the germs. And if the patient can be rendered comfortable, and his temperature lowered for a number of hours by a cool bath, or sponging with tepid water, it is better in the end than if the remission of his fever had been obtained at the expense of profound systemic effects from the use of powerful drugs.]

9. *The action and uses of antipyretic medicines administered internally upon septicæmia and allied conditions* were discussed as follows in a paper by Professor Binz, read before the International Medical Congress: 1. Antipyretics act in two ways; first, by increasing the discharge of pyrexial heat; second, by checking its production. 2. The quantity of heat discharged may be augmented by direct withdrawal (tepid water), or by facilitating cutaneous circulation (digitalis, cutaneous irritants). 3. The production of heat may be lessened by repeated cooling of the surface,* and especially by the internal use of antizymotics. 4. Febrile diseases commonly owe their origin to the introduction and rapid development of substances akin to ferments. Several of these have been shown to resemble yeast in being low vegetable organisms, or derived from such organisms. They enter the glands, where they undergo multiplication, increase the metabolic processes, generate products of decomposition which exert a paralyzing influence upon the nervous system, and raise the standard of temperature throughout the body. 5. Owing to impaired action of the heart in certain stages of the disorder, or to contraction of the cutaneous vessels, the skin becomes anæmic, and gives off less heat than usual. The internal temperature rises accordingly. 6. Quinine, our chief antipyretic, acts by directly combating the efficient cause of the disorder, and checking the abnormal metabolism going on in the body. The nervous system takes no part, or only a subordinate part, in this operation. In intermittent fevers, quinine prevents the paroxysms by attacking their infective cause. The paroxysms are not the essence—the substantive element—of the disease; they are only a symptom of it. The substantive element is the poison deposited in the colorless corpuscles of many organs, especially the spleen.* There are fevers without paroxysms, and paroxysms without fever.† It is just those intermittent fevers that run their course without paroxysms that are most malignant. The malarial poison rapidly causes disintegration of the tissues and the blood, and so paralyzes the nerve-centers. 7. The reduction of acute splenic tumors by quinine depends upon the adverse influence exerted by the alkaloid upon the infective poison to which the morbid over-action of the spleen and its consequent enlargement are due. "*Cessante causa cessat effectus.*" Even a healthy spleen may be reduced in size by large doses of quinine, the alkaloid vigorously checking the oxidation of its principal elements, the colorless corpuscles. Quinine has no direct effect upon the vaso-motor nerves. 8. Quinine attacks the malarial poison with especial energy; on this fact depends the so-called specific effect of quinine upon malarial fevers. The same relation, but in a minor degree, subsists between quinine and the infective poison of enteric fever, between mercury and iodine and the poison of syphilis, between salicylic acid and the "irritant" in acute articular rheumatism. 9. An antipyretic which in one disease instantaneously arrests the fever may be wholly powerless in another. The difference depends on the fact that the various antizymotics act very unequally on the individual *schizomycetes* and ferments; one will paralyze them rapidly, by another they will scarcely be affected. 10. The past history of therapeutics and recent achievements in the domains of etiology and pharmacology entitle us to assume

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* Certainly cooling of the surface would seem to call for classification among the means which withdraw heat from the surface, and not among those which check its production!

* Professor Binz seems here to believe that the pigment observed in the blood (especially in the white blood corpuscles), spleen, liver, brain, etc., and the malarial germs, are identical.

† It is almost impossible to conceive of a distinct malarial paroxysm without fever. Of course, this question all turns upon what we are willing to call a paroxysm.

that, by persistent scientific inquiry and practical observation, we may succeed in discovering a specific antidote for every species of infective or septicæmic malady.

10. *The justifiability of antipyretic treatment* is discussed by Dr. Haddon as follows: In Germany the pyrexia is believed to be the cause of the changes which produce death in fevers. On this theory the antipyretic treatment has been adopted, which consists in placing the patient in a cold bath, to reduce his temperature by the direct abstraction of heat. The author believes that such treatment is unjustifiable, for the following reasons: 1. The theory is incorrect. *a.* This is proved by the fact that many cases are on record in which the temperature was much higher continuously than the advocates of this theory believe to be certainly fatal, and still all the bodily functions were healthy, and recovery followed. *b.* We find that a temperature which in one disease is regarded as almost certainly fatal, is by no means of such serious import in another. *c.* In the same disease one frequently sees the identical symptoms as severe in conjunction with a low temperature as with a high one. 2. It is dangerous, as may be seen in any case where energetic antipyretic treatment is followed out. And this danger seems out of proportion to the benefit derived.

15. A report by Dr. Donath on *tartrate of quinoline, a new antiseptic and antipyretic agent*, contains the following facts: It is a reliable antipyretic. In the proportion of 1 to 500 it prevents the lactic fermentation of milk, the decomposition of urine and gelatine, and the development of bacteria in artificial cultivation fluids. Therefore tartrate of quinoline is superior in antiseptic power to sodic salicylate, carbolic acid, quinine, boracic acid, copper sulphate, and alcohol. In the proportion of 1 to 250 it prevents the putrefaction of blood and the curdling of milk. In the proportion of 1 to 100 it prevents the coagulation of blood. It is decomposed in the body and does not appear in the urine. Therapeutically, it is employed with success in enteric and intermittent fevers, in periodic neuralgia, and as a local antiseptic. Dose to adults, two grammes (gr. xxx) in wafers. Children take it readily, dissolved in equal parts of syrup and distilled water. It causes no unpleasant after-effects, and the absence of giddiness and *tinnitus aurium* is especially remarked.

16. MM. Dujardin-Beaumetz and Callias, in a paper upon *resorcin, its uses and therapeutic applications*, arrive at the following conclusions: 1. Resorcin has the same properties as carbolic acid, salicylic acid, and the other substances of the aromatic series; it prevents fermentation in the proportion of 1 to 100, and prevents putrefaction in the proportion of 1½ to 100. 2. Resorcin is less toxic than carbolic acid, which may be approximately presented as follows: *a.* From 30 to 60 centigrammes (gr. v-x) of resorcin to every kilogramme (about 2 lbs.) in weight of the animal, produces trembling, clonic convulsions, increased frequency of the heart's action and respiration; all these disappear at the end of an hour. Consciousness and sensation are unaffected. *b.* Stronger doses produce vertigo and loss of consciousness; sensibility is blunted; clonic convulsions are frequent and violent. The pupils are dilated; respiration and the action of the heart both become very frequent. Recovery in two hours. *c.* Larger doses than 90 centigrammes per kilogramme (gr. xv to 2 lbs.) produce accentuation of the symptoms described, with death in twenty minutes. The temperature rises before death. Cadaveric rigidity, on the average, fifteen minutes after death. 3. Resorcin has no effect upon the blood elements unless it remains for a long while in direct contact with them. 4. It is a remedy which may be used externally or internally in all diseases where the development of organisms is a factor. The antirheumatic and antipyretic powers of resorcin are not yet well defined. 5. The authors express the wish that resorcin, in view of its greater solubility, its almost imperceptible odor, its less toxic and irritant properties, may be experimented upon in connection with surgery, to discover if it may not with advantage be substituted for carbolic acid.

22. M. Vigouroux, the assistant of Charcot at La Salpêtrière, in a paper of considerable interest, collects what has been discovered, and at various times communicated to the profession, with reference to *metalloscopy, metallotherapeutics, and æsthesiogenics in general.* In 1876 M. Burq reported to the Société de Biologie the fact that the application of a metal (generally in the form of a disc, like a piece of money) to the skin of an anæsthetic patient brought about a return of sensibility, which, however, was in most cases only temporary, the anæsthesia recurring after a variable interval, or after the removal of the metal. Different metals were efficient in various degrees; and this was also found to vary in different individuals, some being susceptible to one metal, others to another. The name *metalloscopy* was applied to the subject, including also the various effects upon circulation, temperature, etc., following the application of metallic plates to the surface. By *metallotherapeutics* is meant the therapeutic application of metalloscopy. At this stage of the matter M. Burq conceived the notion that metals applied to the mucous surfaces—that is, given by the mouth—might have a similar influence; for instance, in a case where gold applied to the surface temporarily relieved anæsthesia, gold leaf, rolled into pills and administered by the mouth, might also relieve the anæsthesia. This he called *internal metalloscopy;* and with true French enthusiasm he depicted the grand results which might be anticipated from combined external and internal metallotherapeutics, the disease being, as it were, brought between two fires. Further experiments revealed the fact that other substances beside metals possessed the power of restoring sensibility in anæsthetic parts, such as gutta-percha, wood, collodion film, etc.; and also different forms of electricity were observed to produce the same results. A wider term than *metalloscopy* being therefore required to include these new agents, *æsthesiogenics* (æsthésiogènes) was decided upon as a generic term, which should include and be applicable to all possible agents or influences which could restore sensation in anæsthetic parts. It is evident that the term *æsthesiogenics* refers to the agents rather than to the process itself, and also that it contains no allusion to effects upon temperature, etc.; but the results of investigations have been so various and surprising that it is hard to conceive of a single word which would embrace and classify them. M. Burq discovered that the application of certain metals restored sensation in anæsthetic parts; he also observed that in anæsthetic patients who wore thimbles, rings, bracelets, etc., the skin was often sensitive in their vicinity. The metal which is suited to a given case must be ascertained experimentally, a number being tried until an efficient one is hit upon. If a metal which at first restores sensation be kept for a long while in contact with the skin, anæsthesia in most cases finally returns (*anæsthésie de retour*). While M. Burq's investigations had reference exclusively to general sensibility, Charcot went further. Having already called attention to the fact that in cases of hysterical hemianæsthesia there were generally also present on the same side amblyopia, loss of taste, diminished muscular power, diminished temperature, color-blindness, diminished hearing power, etc., he now showed that the application of a suitable metal caused these various troubles to disappear simultaneously with the anæsthesia with which they were associated. It may be observed here that Charcot's experiments are all made upon hysterical patients. Charcot further demonstrated the *transfer* (*transfert*) and *oscillations.* In a hemianæsthetic patient, while the application of a metal was causing her various troubles to disappear from the side originally affected, it was observed that they reproduced themselves *pari passu* on the side originally healthy; the symptoms were not therefore *relieved*, in a proper sense of the word, but merely *displaced*, the amount of disease in the body, if we can employ the figure, remaining the same. When, after a while, the symptoms had returned to their original site (*anæsthésie de retour* of Burq), they were observed for a time to *oscillate*—that is, diminishing degrees of anæsthesia continued rhythmically to present themselves on the originally sound side for some time, balanced by corresponding returns of sensation to the side originally anæsthetic, until at last matters stood exactly as before the operation. This whole description is vividly suggestive of the manner in which a temporarily displaced pendulum returns to equilibrium. Still further, Charcot described the process as follows: Given a case of left hemianæsthesia with a metal applied to the left forearm. At the moment when sensibility is appearing at the border of the metal, it is also found to be appearing in a somewhat analogous area on the left leg; over corresponding areas on the right arm and leg (originally healthy) anæsthesia begins to show itself. These areas spread until at last sensation has been restored to the left side and the right side is completely anæsthetic; this *transfert*, as has been said, includes also the other nervous disturbances associated with the hemianæsthesia—taste, smell, hearing, muscular power. temperature, etc. So much for *æsthesiogenesis*, *transfer*, *oscillations;* another phenomenon is *produced anæsthesia* (anæsthésic provoquée). To illustrate it: Given a case of hemianæsthesia; apply a metal, previously found suitable to the case, to the sound side. Immediately anæsthesia develops on the sound side to which the metal is applied, while sensation returns to the affected side. This is *produced anæsthesia;* it has a prognostic value, as follows: Given a patient with hysterical hemianæsthesia, whose symptoms have disappeared, and who is supposed to be cured. Apply a metal to which she used to be susceptible to the side originally sound. If any anæsthesia is produced, then the hysterical diathesis is not yet cured, and the patient is still liable to relapses. The discovery of *produced anæsthesia* renders possible the following generalization: 1. Æsthesiogenetic action is essentially bilateral. 2. It has for an immediate and invariable result the placing of sensibility (and other connected functions) in a state of activity the converse of that which was originally present. In hysterical cases æsthesiogenics are powerless when a paroxysm is impending. Another strange fact is the following: If, while a patient is experiencing the influence of a metal to which she is susceptible, another metal to which she is *not* susceptible be superimposed, matters are brought to a standstill and remain *in statu quo* almost indefinitely, or until the metal is removed. If a third metal, to which she *is* susceptible, be still superimposed, the patient responds to its influence as if the first and second were not present. Æsthesiogenics have been used in cases not hysterical; the cases are few, but the results seem to have been the same, with two exceptions—there is no *transfer*, and improvement persists to a greater or less degree.

The author proceeds to speak of different theories which have been advanced in the effort to explain the phenomena which have been described. The most prominent are: 1. Skepticism in various degrees, viz.: *a.* Entire disbelief of the facts noted, attributing them to errors of observation, and considering hysteria to be nothing more than a morbid disposition in young women to deceive themselves or others, or both. *b.* Another form of skepticism is that which explains all that has been described by the hypothesis of *expectant attention*, so-called. This idea, first advanced by John Hunter to explain mesmerism, consists mainly in the fact that if a person intensely fixes his attention upon a part, and imagines that he will feel in it warmth, cold, pain, etc., he soon does seem to feel the expected sensation, in a greater or less degree. Such phenomena would be accentuated in hysterical patients, and it is in these that the effects of metalloscopy are most distinct. The author, in this connection, remarks that he will not answer those prejudiced individuals who profess to doubt entirely; to those who ascribe everything to imagination, he answers that if this were the case it would be easy to prove it by changing the metals, the poles of the battery, etc., without the knowledge of the patients. This system of investigation has been thoroughly followed out in La Salpêtrière, but only with the result of rendering the reality of the phenomena more apparent. 2. The hypothesis of an electric action in the case of metals at once suggests itself. To prove this, two plates of the same metal were applied, previously connected by a wire and galvanometer; in this way the fact was established that a feeble current was generated. And it was further proved that a galvanic current of the same strength reproduced the phenomena following the application of the metals. To extend these results to make them apply to the case of a single metal plate being used, it is necessary to assume that the lack of homogeneity in the plate is sufficient to admit of the generation of currents between different parts of the same plate. Unfortunately, these experiments were made before anything was known of *transfer* and *oscillations;* they, therefore, require repetition. To thus explain the metalloscopic phenomena, it is necessary to assume that the metal and body constitute a Voltaic couple, the body being qualified to act by virtue of being largely composed of solutions of chlorides, which are known to be active in this connection. 3. *Static electricity* is the best and most universally applicable æsthesiogenic. No special explanation of its mode of action in this connection is attempted. 4. The application of a *tuning-fork* in such a way that its vibrations are communicated to the part to be affected is among the most effective modes of æsthesiogenesis. This is not explained. 5. *Magnets* are very effective, and a feeble one is as efficient in this connection as the most powerful. Maggiorani says that the influence of a magnet may be exerted satisfactorily even when it is in the physician's pocket, his hand being upon it, while with the other he pretends to be counting his patient's pulse. Not explained. 6. Various chemical agents, such as solutions of mineral salts, sinapisms, vesicants, etc., have more or less æsthesiogenetic action. Their action is not explained.

The author says that the phenomena of æsthesiogenesis, as presenting themselves in hysterical patients, differ only in degree from those occurring in individuals with organic lesions and other nervous diseases than hysteria. He therefore considers that, while it is convenient to study the subject among hysterical patients, the results of his investigations admit of more or less general application. He believes that this is the first great step toward a system of *physical* medicine by which the physiological and pathological processes may be profoundly influenced and controlled in a way which it is difficult to conceive of in the present state of our knowledge.

37. Dr. Hammond, in a short paper upon *the therapeutic use of nitro-glycerine*, says that he has used it a great deal. He always employs a one-per-cent. solution in absolute alcohol, one drop of which is quite enough for a commencing dose; this may be repeated in half an hour, if desirable. The effects are similar to those of nitrite of amyl, only more persistent; there is arterial fullness, with throbbing, and flushing of the surface. It is very serviceable in migraine, when the latter is due to anæmia, or at least associated with it. Du Bois Reymond thinks that all migraine is anæmic; Mollendorf believes that all migraine is hyperæmic; Eulenburg and Gutmann believe that some cases are attended with hyperæmia, while in others anæmia is present. Examination of the retina with the ophthalmoscope will show if there is congestion or anæmia on the affected side; pressure upon the carotid of the affected side will afford relief in congestive cases; exacerbation will follow in anæmic cases. Nitro-glycerine should be given in drop doses of the one-per-cent. solution every half hour until flushing of the surface and increased arterial pulsation show that the physiological action of the remedy is being induced. Everything depends upon the diagnosis; harm will be done in hyperæmic cases. The author has used the drug in epilepsy, especially in cases of *petit mal*, in conjunction with the bromides; the *modus operandi* in these cases is obvious. [Dr. Hammond tells us nothing new in connection with nitro-glycerine except, indeed, one very practical and important fact—where we can buy it. Under the name of *glonoin* a homœopathic preparation is for sale, but it is impossible to find out from the scientific and visionary gentlemen who prepare it what its strength actually is. We have sought in vain in all the best drug stores for a reliable article, and we are thankful to Dr. Hammond for the information that such may be obtained from Bernicke (Boericke?) & Tafel, New York.]

41. Dr. Wolfenden, in recommending *agaricus for the night-sweating of phthisis*, describes it as a light, bulky, brown powder, of a bitter taste, dose twenty grains, best prescribed in a confection made with a little jam. He says that it has been much used in France, and is the best remedy he knows for night-sweats, as efficient as atropia, yet free from danger or unpleasant effects. He has seen it cause diarrhœa, which may be checked by the addition of a very little opium; in one case nausea resulted from a dose of thirty grains. In this case a dose of twenty grains was effective in checking the sweats, and did not produce nausea. The author has used the remedy in forty cases of phthisis, and confidently recommends it.

43. In a very able and interesting paper Dr. De Watteville criticises, after a most destructive fashion, what is so often spoken of as "*galvanization of the sympathetic*." He does not doubt that improvement in many conditions results from galvanization in the neck, but refuses entirely to believe that it is due to stimulation of the sympathetic. Certainly nothing in medical literature is more vulnerable than the explanations by enthusiastic practitioners of the cures which they have achieved through the sympathetic, influenced in different ways. We may summarize the author's arguments as follows: 1. The sympathetic nerve, and especially the superior cervical ganglion, is so situated in the midst of structures which are better conductors of electricity than itself, that it is impossible to concentrate the current upon it. Also, such weak currents must be used in the neck to avoid causing faintness, that it is exceedingly improbable, allowing for diffusion, that much electricity can be brought to bear upon the sympathetic itself. Furthermore, we do not in percutaneous galvanization of the sympathetic, as employed therapeutically, observe either of the two principal effects which always follow accurate experimental galvanization of the sympathetic, namely: dilatation of the pupil and contraction of the vessels of the head. It is therefore more than probable that in therapeutical galvanization of the sympathetic the sympathetic is little if at all affected, and the results obtained must be attributed to the influence of the current upon other structures. 2. Many of the most enthusiastic supporters of the treatment profess to derive from it results which are not possible, or at least are irrational. For instance, one authority claims to promote absorption of exudation about the medulla by galvanizing the sympathetic and thereby *dilating the vessels in the medulla.* Now all physiologists are agreed that galvanization of the sympathetic invariably produces *constriction* of the vessels (except, indeed, Onimus and Legros, who hold that galvanization of the sympathetic may cause an increased flow of blood; these authors, however, hold peculiar views about a *peristaltic action* of the coats of the arteries). In the present attitude of physiology it is about as absurd to talk of dilating vessels by stimulating the sympathetic as to speak of stimulating the heart through the pneumogastric! For a second instance, authorities who advocate stimulating the sympathetic to hasten the recovery after apoplectic hemiplegia by promoting absorption of the clot, commonly galvanize on the paralyzed side; in other words, *stimulate the sympathetic that is distributed to the vessels that go to the sound side of the brain.* Such amusing instances of erroneous notions of physiology and anatomy are numerous throughout the literature of the subject. To quote from Clifford Allbutt: "The sympathetic system has become a refuge for the destitute of hypothesis." To quote further from the same author, in a burst of satire: "Here is a neck, and inside the neck is a sympathetic nerve-system; if we galvanize the neck, the current will flow somewhere about the tissues, according to their various conducting powers and other physical conditions; therefore the sympathetic may probably come in for some of it, and we all know that a galvanized sympathetic causes contraction of the blood-vessels. Now, there are blood-vessels all over the body, and in the brain, as elsewhere; so, perhaps, they will be kind enough to contract among others, and perhaps contracting (or dilating reflexly) may do the brain some good, though how, it is not clear. Meanwhile, if we see no change in the pupil, ear, or cheek, or but slight changes only, we must have faith and hope that more sensible changes are going on within. Surely this is the very midsummer madness of reasoning!" [Two propositions of De Watteville's, very confidently put, seem none the less open to criticism; they are as follows: 1. He says: "Much labor has been expended over the investigation of the retinal vessels during galvanization of the sympathetic. Beard and Rockwell devote a considerable space to the description of their results, which were unsatisfactory. No wonder, *since the vaso-motor nerves of the retina do not pass through the cervical ganglion, but are contained mainly in the trigeminus!*" This sounds very plausible and decisive, but let us consider whence the vaso-motor fibers come which are "contained in the trigeminus." They certainly come from the ganglion of Gasser; and the ganglion of Gasser assuredly communicates very freely with the carotid plexus of the sympathetic; and the carotid plexus is made up of branches from the superior cervical ganglion. So that branches of the cervical sympathetic do reach the retina, and the author in his attack upon others has certainly laid himself open to the charge of *de te fabula.* 2. In another place the author scouts at the idea of the vaso-motor center in the medulla being affected by galvanization of the sympathetic, and derisively compares it to "a dog running after his own tail." However difficult of therapeutic application, there is certainly nothing theoretically absurd about the idea. The activity of the vaso-motor center is certainly influenced by its blood supply, and this may surely be affected by a galvanization of nerves which can cause contraction of those branches of the vertebral artery which go to the medulla. Even such a slight impression upon a sensory nerve as occurs in the course of vaccination may produce such reflex inhibition of the heart through the pneumogastrics that the circulation is retarded, the brain becomes anæmic, and slight convulsions with unconsciousness take place. Compared with such involved and intricate mechanisms, a dog's efforts to catch his tail seem simple and rational enough.]

58. Dr. Coesfeld, speaking of *the curative action of iodoform*, calls attention first to the paper of Professor Moleschott on the subject, in which the latter reports three cures out of five cases of acute hydrocephalus (acute tubercular meningitis) treated with that drug. Professor Moleschott employed the iodoform in solution in collodion, and applied it with a brush to the neck, the mastoid process, the brow, and the temporal region, three or four times a day. Professor Moleschott is so delighted with his cures that he expresses himself as "inclined to sing a love song to iodoform"; he believes that, even if his ratio can not be perpetuated (60 per cent.), it will be a great thing to save even 5 or 10 per cent. of cases of a disease in which an unreservedly bad prognosis has been the rule. The author proceeds to state that, having been unable to find any literature on the subject, he feels encouraged to report seven cases of his own, of which two went on to complete recovery. He used in all the cases no medicine except iodoform collodion, applied in the manner directed by Moleschott; he used a 15- or 20 per-cent. solution in place of the 10-per-cent. solution employed by Moleschott. Of the author's seven patients, four were boys and three girls. Their ages ranged from two to nine years. All his cases were typical, with distinct prodromal stage followed by convulsions, squint, ptosis, etc. He noticed a decided antipyretic effect following the applications of collodion, in addition to a general controlling influence over the course of the disease. To be effective, the iodoform solution must be strong, and must be thickly applied; the surfaces treated should also occasionally be washed clean with a mixture of alcohol and ether, so that fresh applications may rapidly take effect. In some cases Moleschott used iodoform ointment, but this is not so clean a method of application. [The author does not give detailed histories, and no mention is made of ophthalmoscopic examinations; it is to be feared that critical readers of his encouraging views will be inclined to doubt the diagnosis in those cases which ended in recovery. Probably, in the present state of our knowledge, recovery from what is supposed to be tubercular meningitis is stronger evidence against its existence than any affirmative evidence which could be adduced.]

59. Dr. Henry reports two cases of *supposed poisoning from iodoform* which ended fatally. He represents himself as very much astonished at these unfortunate accidents, the free application of iodoform having been so well borne in so many cases under his observation, even in little children. The first case was that of a laboring man, fifty-seven years of age, well nourished and strong, upon whom resection of the elbow joint was performed for tuberculous osteitis. The wound was filled with iodoform, 150 to 200 grammes (℥ v — ℥ vjss.), and bound up tightly with a carbolized bandage. The iodoform used was from the same lot with which many other patients had been treated, and the dressing and treatment were identical with that which had been conspicuously successful in many cases. The patient reacted well from the influence of chloroform, and was well the morning after the operation. The urine contained no albumen, and was in other respects normal; like that of all patients treated in this way, it contained a large quantity of iodides. Two days after the operation the patient developed symptoms resembling those of delirium tremens; temperature and urine still normal. During the following days the patient grew rapidly worse. His pulse became feeble and frequent, and his respiration shallow; his delirium ran gradually into coma, in which condition he died. His death occurred eight days after the operation; he never had notable rise of temperature or albuminous urine. His symptoms were delirium and coma, with loss of heart power. The iodoform was removed from his wound two days before his death, but without any improvement resulting. The second case was that of a woman sixty-three years old, with

abscess about the knee joint. The abscess was opened and dressed as in the preceding case. The death and symptoms were about the same; fatal termination sixteen days after the operation. On post-mortem examination, granulo-fatty change was found in the heart in both cases in significant degree. The man presented also degeneration of the liver and kidney parenchyma; no signs of meningitis. [There was, as may be observed, nothing typical or diagnostic in these cases. The only inference drawn is that large quantities of iodoform in an open wound *may* be dangerous.]

QUARTERLY REPORT ON VENEREAL AND GENITO-URINARY DISEASES.

No. VIII.

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40. Thompson, Sir H., *et al.*—Discussion on recent advances in the methods of extracting stone from the bladder. [Internat. Med. Congr.] "Brit. Med. Jour.," Sept. 17, 1881.
41. Krabbel.—Ueber antiseptische Lithotomie. "Centralbl. f. Chir.," Aug. 20, 1881.
42. Bennett, E. H.—Rupture of the bladder. [Path. Soc. of Dublin.] "Dublin Jour. of Med. Sci.," July, 1881.
43. Braun, H.—Ueber Nierenexstirpationen. "Dtsch. med. Woch.," July 30, Aug. 6, 1881.
44. Braun, H.—Ueber Nierenexstirpation. Nachtrag. *Ibid.*, Aug. 13, 1881.

3. The "*balano-postho-mycosis*" described by Dr. Simon is an affection of the glans penis peculiar to diabetes, and produced by a fungous growth. At first a slight irritation is noticed with some erythema; then a more intense inflammation and secretion. Afterward the part becomes sore, painful, and excoriated, and phymosis is present. Eventually the condition resembles papilloma acuminatum. Occasionally there are growths of a callous character. All of these growths are permeated by fungi consisting of mycelia and spores. The treatment consisted of the local use of salicylic acid and drying powders. The prognosis is said to be worse than in a simple balanitis.

20, 21. Dr. Erb believes in a "certain *etiological connection*" *between locomotor ataxia and syphilis.* He had previously reported statistics showing that in 100 cases of locomotor ataxia 88 gave a history of previous syphilis. Of 13 patients observed since, 12 had had syphilis. Of all other nervous diseases 77 per cent. gave no history of syphilitic infection. The writer states that the ataxia begins from five to fifteen years after the infection. ═══ In the discussion which followed, most of the speakers were disposed to deny the importance attached to syphilis by Erb in this connection. M. Lancereaux maintained that the locomotor ataxia of syphilis was a disease of more limited extent than that arising idiopathically. The portion of the cord affected was more circumscribed. He denied the existence of dynamic effects of syphilis, all the affections properly syphilitic being determined by certain localized organic changes. ═══ Dr. Althaus, in an article on this subject, also takes exception to Erb's views, though he admits that in the vast majority of his recorded cases of ataxia a history of syphilis was present. He believes that locomotor ataxia is a "disease *per se*," which occurs where there is no syphilitic taint, but admits that the process may be initiated by syphilis. The frequent association of the former disease with syphilis is supposed to be owing, first, to the fact that syphilis, like masturbation and other excesses and irregularities, deteriorates the nutrition and the power of resistance of the central nervous system; and, secondly, and more particularly, to the specific tendency of the syphilitic virus to lead to low forms of local inflammation, which, when once established, are apt to spread in certain definite parts. "Where this kind of inflammation attacks the posterior root-zones of the spinal cord it will produce the clinical aspect of locomotor ataxia, being aided in its development and further progress by the natural tendency of spinal disease to invade symmetrical and homologous anatomical and histological portions of the organ."

26. M. Bouilly has produced an exceedingly interesting and exhaustive paper on the operation of *castration.* He first discusses some of the facts which pertain to the operation in connection with the practice of altering colts, with a view to determine the frequency and character of the accidents to which it is liable. It appears that colts are especially liable to the dangers of tetanus and peritonitis, which are much less apt to occur in the human subject. To peritonitis the horse is exposed through anatomical peculiarities, while tetanus is an accident favored by the peculiar nervous system of the species. The latter accident is more apt to occur as an epizoötic disease than as the result of anything in the mode or method of operating. Likewise, in castration in the human subject the statistics are insufficient to prove that in the rare instances of tetanus the complication was necessarily attributable to the mode of operation. The writer devotes his attention particularly to the manner of ligating the cord. Two methods are considered especially — namely, "*la ligature en masse*," where the entire cord is ligated, and "*la ligature isolée*," where only bleeding vessels are tied. The former method is an exceedingly old one. The points of chief importance in connection with it are the selection of the point of ligation, the thorough constriction of the vessels, and the choice of the material with which the ligation is effected. The point of application for the ligature should depend upon the case. If the operation is done for malignant tumor of the testicle, the cord must be tied as high as possible; ordinarily, when the testicle is healthy, two fingerbreadths from the gland is sufficient. The writer favors the use of catgut for the ligature, which undergoes absorption, and thus avoids the dangers associated with separation of the ligature. In certain cases ligation *en masse* is recommended as the preferable operation; for instance, in castration where inguinal ectopia of the testicle exists, and the cord is very short and liable after section to retract toward the abdomen. Generally, however, *la ligature isolée* is preferred. After a careful review of all accessible statistics, the writer has been able to find but one instance of well-authenticated tetanus following this method of operating, and he also believes that by this means hæmorrhage can much more certainly be prevented than by ligation *en masse.* With regard to tying the veins, his opinion is in its favor. In this connection he refers to a remark of Verneuil, who explains the venous hæmorrhage which occurs after castration by "the absence of valves in the spermatic veins." The validity of this explanation the writer denies, and proceeds to show, on the authority of others and of his own experience, that such valves do normally exist, though insufficient to insure against hæmorrhage. Among the methods of operation which the writer condemns is that by means of the écraseur. He claims that it affords imperfect security against hæmorrhage, and leaves a wound indisposed to immediate union, and he regards it as suspicious on the score of tetanus. The article closes with the following conclusions: *a.* From the known facts no procedure for ligation of the cord affords any positive security against hæmorrhage, either immediate or remote, or against nervous complications. *b.* Hæmorrhage in both modes of ligation—ligation of the whole cord and ligation of bleeding points only—appears to be attributable only to a vicious or incomplete manner of applying the ligature—insufficient constriction or negligence in searching for divided vessels. *c.* Tetanus appears to have shown itself more frequently after ligation *en masse* than after other methods of hemostasis, without it being possible to establish any evident relation of cause and effect between this complication and the constriction of the cord. *d.* The isolated ligation of the arteries, which is more difficult of execution, but is in better conformity with the general rules of practice, should, in the majority of cases, be the procedure chosen. *e.* Prudence requires that the spermatic veins should be included in the ligature. *f.* Ligation *en masse* might be reserved for castrations practiced upon children or adolescents, in whom the cord is still small, or for ablations of the testicle in ectopia. The ligature should be tied very tight, in such a way as to insure hemostasis and to destroy all sensibility. *g.* In all cases the ligation should be done with an absorbable ligature, which permits immediate union without regard to its elimination. *h.* The other methods are uncertain or useless.

30. MM. Brissaud and Segond contribute to *the pathological anatomy of stricture of the urethra* the results of microscopic examination in two cases of stricture of the bulb. One of the cases had been treated by internal urethrotomy, the other by gradual dilatation. Both patients had died of diseases unconnected with the strictures. The microscopical appearances of the strictured urethra were the same in both cases, and one description served for both. Sections were made through the middle of the strictured portion at right angles to the axis of the urethra. On the inferior aspect of the canal there was a dense triangular mass of fibrous tissue, which by a truncated summit corresponded with the mucous membrane above and with the membrana albuginea below, thus completely replacing the corpus spongiosum. It was broader below than above, and its base occupied one fifth of the circumference of the enveloping tissue of the spongy body. It was but slightly vascular, containing only a few capillary blood-vessels. On the superior aspect of the urethral canal the appearances were different. Here there was a new tissue development, which evidently belonged to the stricture, and was composed of an intricate network of connective-tissue fibers, mingled with fine fibers of *elastic* tissue. The elastic fibers were taken to be vestiges of the normal spongy tissue, the latter not having been entirely replaced, as was the case in the lower wall of the urethra. Upon either side of the urethra the spongy tissue remained unaffected. The urethral walls were thus divided into four segments: an inferior "fibrous," a superior "elastic," and two lateral segments of normal spongy tissue. The appearances seemed to the writers to indicate that the inflammatory process had had its seat primarily in the mucous membrane, thus opposing the views of Mercier and Guérin, who hold that the mucous membrane does not participate actively in the production of stricture, but that the contraction is due to inflammatory processes occurring originally in the spongy tissue, an exudation there taking place of fibrinous material, which is followed by a peripheral phlebitis and a localized induration, the mucous membrane being simply pushed before it. The grounds for the opinion expressed by the writers, that the mucous membrane is primarily affected, were that the epithelium was found altered, showing little nodular or papilliform proliferations upon the surface; and the corium was thickened and infiltrated with abundant embryonal elements. Moreover, the inferior and superior zones of fibrous thickening extended only so far as the changes in the mucous membrane were traced, and these zones diminished gradually in breadth the farther they were from the center of the strictured portion, till at length they formed mere thin partitions separating incompletely two portions of healthy spongy tissue. Considerable importance is attached to the presence of the elastic tissue found in the upper portion of the stricture, as bearing upon the operation of urethrotomy and upon the dilatability of strictures. Reference is made to the teachings of Guyon, who has named the upper wall of the urethra "*la paroi chirurgicale*," inasmuch as that is the wall he selects for operation. He does this for the reasons that this wall is less vascular than the lower; is held more firmly in place, on account of its intimate connection with the corpora cavernosa, and therefore is less liable to shift its position or form folds when the attempt is made to incise it; and, finally, this wall is more elastic, and hence a longitudinal wound through it is less liable to close. The writers are of the opinion that their discovery of elastic fibers in the superior wall of the stricture corroborates Guyon's views. [It is clear that our writers' investigations are far from being conclusive. They have not made it certain that a periurethritis may not have existed independently of the mucous inflammation of the urethra, to which the latter may, so far as we can see, have been secondary. And as to the presence of the elastic fibers, it is not shown that the cases given are typical ones, nor that they may not in other cases be present also in the inferior wall, or, indeed, absent altogether from both walls.]

32. Dr. Eldridge, Surgeon to the General Hospital of Yokohama, Japan, is a strong supporter of the tenets of Dr. Otis regarding *the pathology and treatment of urethral stricture.* He states that he has performed internal urethrotomy in one hundred and sixty-two cases. Of these, thirty-two, which were under observation for periods varying from two to five years after the operation, it is stated, had shown no signs of recontraction. He relates again the case given in the appendix to the last edition of Dr. Otis's work on stricture, in which an alleged radical cure following urethrotomy was shown by post-mortem examination. He also reports two other cases, one of which is cited as illustrating the "reflex effects" of stricture, relieved by urethrotomy, and the other as an instance of the severe structural changes in the urinary organs which may result from stricture of comparatively large caliber. In the first case it is claimed that a very persistent headache of long standing was relieved completely, and at once, by cutting a slight urethral stricture in the bulb. In the second case a patient who had died of Bright's disease was found to have an hypertrophied and sacculated bladder and dilated ureters and pelves, together with degeneration of the renal pyramids. All these grave lesions were attributed to a stricture of the urethra which would readily admit a No. 9 (English) sound, the normal caliber for the urethra being not over 12. [We doubt if these cases will carry conviction to the minds of any readers not already committed to the Otis school. The first case is not free from the suspicion of a *post-hoc-ergo-propter-hoc* fallacy, and in the second case the writer's assumption is even more incredible. It is stated that there was no history in the case of any spasmodic symptoms, and there is no suggestion that the stricture had ever been any tighter than it was found to be post-mortem. What is more, we have no information regarding the condition of the urethro-vesical orifice. To the writer's statement—that "most of the prominent writers upon urethral surgery" have been led "to acknowledge that measurement of the penis does furnish a guide to the dimension of the urethra"—we decidedly demur.]

40. In the proceedings of the recent International Medical Congress that related to "*rapid lithotrity*," Sir Henry Thompson reported that he had performed the operation ninety times. He urged the importance of limiting the use of large instruments, whether for crushing or removing the *débris*, to calculi of large size, undue distention of the urethra greatly increasing the risk. ═══ Dr. Bigelow spoke of the importance of preventing the return of fragments to the bladder after they had once been removed, and described a valvular contrivance, attached to the evacuator, designed to prevent this. ═══ Mr. Coulson referred to the danger of the lithotrite breaking in the bladder. This had occurred in two of his cases. He thought the instruments were susceptible of improvement. Sometimes he had experienced difficulty in the reintroduction of the evacuator, owing to accumulation of sand in the prostatic portion of the urethra. Usually this difficulty could be overcome by throwing a little water into this part of the urethra, but in two cases he was unable to introduce the evacuator, and the patients died. ═══ M. Reliquet, of Paris, described the lithotrite which he had used for ten years. It was powerful enough for large stones, and not liable to clog. It was designed to be used with a hammer. He considered that the succession of small shocks resulted in a more complete fragmentation of the stone than was obtained by the ordinary method. ═══ Mr. Berkeley Hill expressed the opinion that there were many cases—for example, those of middle-aged men, in whom the deeper portion of the urethra was very sensitive—in which the milder, repeated sittings of Civiale were better borne than the rapid operation of Bigelow.

42. Mr. Bennett describes a very interesting case of *rupture of the bladder.* A sailor, in a drunken fracas, received a blow in the abdomen, probably from a man's head—in other words, had been "butted." When admitted to the hospital, about an hour after, he was pulseless, cold, pallid, and unconscious. After a stimulating drink he vomited, and recovered from the collapse. In half an hour he passed over a pint of urine tinged with blood. The following morning he had no fever, and could pass his water freely. The urine was then a little "smoky." No instruments were passed for three days. It was then discovered that there was a tumor in the hypogastric region. It extended to within an inch of the umbilicus, and was firm and hard. It was supposed to be extravasated blood in the areolar tissue of the pelvis. By passing the finger into the rectum the tumor was found filling the hollow of the sacrum. A catheter was passed, but only a few drops of urine flowed, without blood. Active interference was not thought to be indicated. The temperature was not above 100° F., and there was no rise for two or three weeks. The patient then began to complain of constipation and some tenesmus, but was up and going about. On the second week the urine became fœtid, and the bladder was washed out. It was then discovered that "by shifting the instrument there was a place to the left of the hypogastrium whence more urine could be pressed off," and for the first time the question of rupture arose, but the majority of the surgeons in consultation were disinclined to believe that it had occurred. It was found that the cavity could be injected from the bladder with a disinfectant solution. There was neither redness nor tenderness over the tumor. After a time the patient began to complain of great pain in the abdomen and inability to evacuate the bowels. Relief was afforded only by most active purgatives or by the passage of a long tube into the rectum. Soon after the passage of the tube a violent diarrhœa set in, and the patient died of asthenia. At the autopsy, on cutting through the abdominal wall, a great cavity filled with urine and the fluid contents of the intestines was opened. The entire areolar tissue of the pelvic cavity had sloughed and was completely separated, so that it was removed *en masse.* The bladder, which had been thrust back into the hollow of the sacrum, was perfectly flat and collapsed. In its anterior wall was a perforation of the "size of a half-crown" piece. There had been no peritonitis. There was a rupture of the colon, which was "secondary," and had probably been made by the tube used through the rectum. The colon was adherent to the large cyst. The rupture of the colon was supposed to be the immediate cause of death.

Miscellany.

Army Intelligence.—*Official List of Changes of Stations and Duties of Officers of the Medical Department, United States Army, from October 14, 1881, to November 12, 1881.*—King, William S., Colonel and Surgeon. The extension of leave of absence on account of sickness, granted him in S. O. 105, May 7, 1881, from A. G. O., still further extended six months on account of sickness. S. O. 251, A. G. O., November 7, 1881. —— Byrne, C. C., Major and Surgeon. Par. 2, F. O. 26, C. S., from these Headquarters, relieving him from duty in this Department and directing him to proceed to his proper station, Benicia Barracks, California, is confirmed. S. O. 119, Department of Arizona, October 17, 1881. —— Hartsuff, Albert, Major and Surgeon. The leave of absence granted him in S. O. 214, October 20, 1881, Department of the Missouri, is extended nine months, with permission to go beyond sea. S. O. 251, A. G. O., November 7, 1881. —— McClellan, Ely, Major and Surgeon. Now awaiting orders at Louisville, Kentucky, to report in person to the commanding general, Department of the East, for assignment to duty. S. O. 252, A. G. O., November 8, 1881. —— Gardner, W. H., Captain and Assistant Surgeon. The leave of absence on surgeon's certificate of disability granted him in S. O. 138, June 18, 1881, from A. G. O., extended three months on surgeon's certificate of disability. S. O. 239, A. G. O., October 31, 1881. —— Tremaine, W. S., Captain and Assistant Surgeon. The extension of his leave of absence on surgeon's certificate of disability, granted him in S. O. 112, May 16, 1881, from A. G. O., still further extended three months on surgeon's certificate of disability. S. O. 238, A. G. O., October 20, 1881. —— Meacham, F., Captain and Assistant Surgeon. To accompany, from Fort Trumbull, Connecticut, to the Military Division of the Pacific, Batteries C and M, First Artillery, ordered to start on 1st instant; upon completion of this duty to rejoin proper station in Department of the East. S. O. 66, Military Division of the Atlantic, November 8, 1881. —— Koerper, E. A., Captain and Assistant Surgeon. Relieved from further duty at Yorktown, Va., and to proceed to Plattsburg Barracks, New York. S. O. 191, Department of the East, November 3, 1881. —— Corson, J. K., Captain and Assistant Surgeon. Confirms telegraphic instructions of this date directing him to report to the commanding officer, Battalion Fourth Artillery, at Fort Yuma, California. S. O. 114, Department of Arizona, October 5, 1881. —— Dickson, J. M., Captain and Assistant Surgeon. Granted leave of absence for four months. S. O. 232, A. G. O., October 13, 1881. —— Carvallo, C., Captain and Assistant Surgeon. Granted leave of absence for one month on surgeon's certificate of disability, with permission to go beyond the limits of the Department and to apply for five months' extension. S. O. 108, Department of the Platte, October 24, 1881. —— Paulding, H. O., Captain and Assistant Surgeon. Relieved from duty in the Department of the East and to report in person to the commanding general, Department of the Platte, for assignment to duty. S. O. 240, A. G. O., October 24, 1881. —— Brown, P. R., Captain and Assistant Surgeon. Relieved from duty in Department of the East, and to report in person to the commanding general, Department of Texas, for assignment to duty. S. O. 240, C. S., A. G. O. —— Skinner, J. O., Captain and Assistant Surgeon. Relieved from duty as Acting Medical Purveyor in the field, and to proceed to his proper station, Whipple Barracks, Arizona Territory. S. O. 123, Department of Arizona, October 26, 1881. —— Finley, J. A., Captain and Assistant Surgeon. To accompany, from Fort Adams, Rhode Island, to the Military Division of the Pacific, Light Battery K and Batteries B and E, First Artillery, ordered to start on the 14th instant. Upon completion of this duty to rejoin proper station in Department of the East. S. O. 66, C. S., Military Division of the Atlantic. —— Turrill, H. S., Captain and Assistant Surgeon. To accompany Battery H, Third Artillery, from Madison Barracks to New York City, and on arrival report in person at these Headquarters for further orders. S. O. 67, Military Division of the Atlantic, November 9, 1881. ═══ Kilbourne, H. S., Captain and Assistant Surgeon, Fort Porter, New York. Granted leave of absence for one month, with permission to apply for two months' extension. S. O. 182, Department of the East, October 11, 1881. ═══ Gardner, E. F., Captain and Assistant Surgeon. Granted leave of absence for four months, with permission to apply for an extension of two months. S. O. 238, C. S., A. G. O. ═══ Corbusier, W. H., Captain and Assistant Surgeon. Relieved from duty in the Department of the Platte, to proceed to New York City, and on arrival report by letter to the Surgeon General. S. O. 240, C. S., A. G. O. ═══ Davis, W. B., First Lieutenant and Assistant Surgeon. Relieved from duty in Department of Dakota, to proceed to Richmond, Va., and on arrival report by letter to the Surgeon General. S. O. 240, C. S., A. G. O. ═══ Arthur, William H., First Lieutenant and Assistant Surgeon. Relieved from duty at Fort Sauders and assigned to duty at Fort Washakie, Wyoming Territory. S. O. 110, Department of the Platte, October 29, 1881. ═══ The following-named medical officers will report in person, without delay, to the commanding general, Military Division of the Atlantic, for temporary duty with regiments about to change stations. Upon completion of their duty with these regiments to report by letter to the Surgeon General: First Lieutenant E. C. Carter, Assistant Surgeon; First Lieutenant H. I. Raymond, Assistant Surgeon; First Lieutenant T. J. C. Maddox, Assistant Surgeon. S. O. 248, A. G. O., November 3, 1881. ═══ Carter, E. C., First Lieutenant and Assistant Surgeon. To accompany, from Fort Adams, Rhode Island, to the Military Division of the Pacific, the headquarters, band, Battery F, and detachment Light Battery K, First Artillery, ordered to start on 10th instant. S. O. 66, Military Division of the Atlantic, November 8, 1881. ═══ Raymond, H. I., First Lieutenant and Assistant Surgeon. To accompany Batteries A and D, First Artillery, from Fort Columbus, New York Harbor, on 10th instant, for San Francisco. S. O. 66, C. S., Military Division of the Atlantic. *Appointments.*—To be Assistant Surgeons, with the rank of First Lieutenant: Edward C. Carter, of New York, October 22, 1881, *vice* Phillips, deceased; Henry I. Raymond, of New York, October 22, 1881, *vice* Otis, promoted; Thomas J. C. Maddox, of New York, October 22, 1881, *vice* Smith, resigned; Richard W. Johnson, of Minnesota, October 22, 1881, *vice* Jaquett, promoted. G. O. 77, A. G. O., October 31, 1881.

Marine-Hospital Service.—*Official List of Changes of Stations and Duties of Medical Officers of the United States Marine-Hospital Service from July 1, 1881, to September 30, 1881.*—Bailhache, P. H., Surgeon. Detailed as member of Board to examine keepers and crews of Life-Saving Stations, September 8, 1881. To inspect the service at stations in Maine, New Hampshire, and Massachusetts, September 9, 1881. ═══ Wyman, Walter, Surgeon. When relieved of special duty as medical officer, Revenue Bark Chase, to rejoin his station, *via* Washington, D. C., August 18, 1881. ═══ Long, W. H., Surgeon. Detailed as Chairman, Board of Examiners, September 12, 1881. Granted leave of absence for twenty-four days, September 24, 1881. ═══ Purviance, George, Surgeon. Detailed as member Board of Examiners, September 12, 1881. ═══ Sawtelle, H. W., Surgeon. Detailed as Recorder, Board of Examiners, September 12, 1881. ═══ Godfrey, John, Passed Assistant Surgeon. To proceed to Pascagoula, Mississippi, as inspector, July 27, 1881. ═══ Goldsborough, C. B., Passed Assistant Surgeon. To proceed to Havre de Grace, Maryland, as inspector, July 27, 1881. Granted leave of absence for thirty days, September 1, 1881. ═══ Cooke, H. P., Assistant Surgeon. Granted leave of absence for thirty days, August 12, 1881. ═══ Carter, H. R., Assistant Surgeon. Granted leave of absence for eight days, September 24, 1881.